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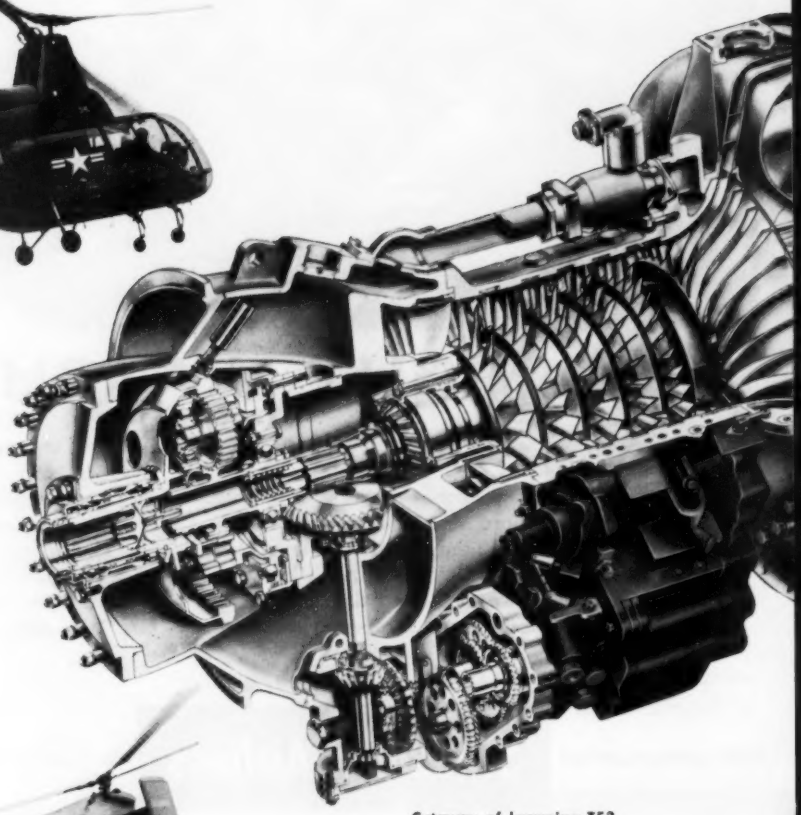

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Vertol Model 105

Grumman Model AO-1

Bell H-40

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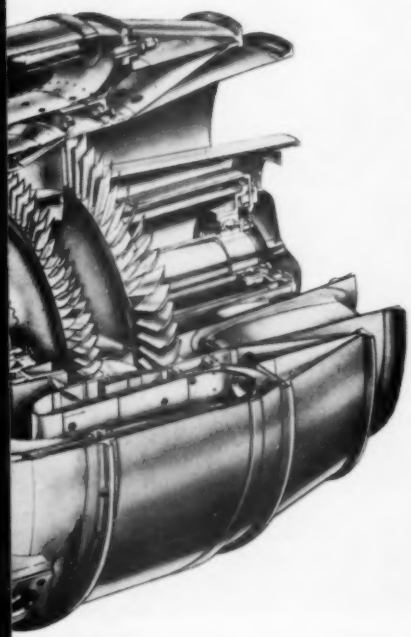

Its remarkably low production cost is but one reason why 6 major aircraft companies have selected the T53. Installed in the Bell H-40 and Kaman H-43B helicopters, the T53 has already earned a reputation as an engine "You can kick" and "Don't need to baby in flight." In addition, the T53 was chosen to power Grumman's new AO-1 High-Performance Observation Airplane as well as Vertol's Model 76 tilt-wing aircraft and Model 105 helicopter, a turbine-powered version of the H-21. The Ryan Model 92 and Doak Model 16 research aircraft—now being readied for flight—will also use the T53. In flying time experience, the T53 has recorded *more hours* than any other turbine engine in the same power class!

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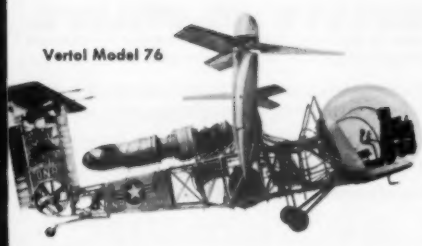
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ARMY

magazine of the **ASSOCIATION OF THE UNITED STATES ARMY**

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EDITOR & PUBLISHER
Lt. Gen. Walter L. Weible, *USA, rtd.*

ASSISTANT PUBLISHER
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Assistants—Arthur S. Welch, Esther E. Bennett, Marguerite M. Mattison, C. M. Pierce, LaRue W. Stump, Mildred M. Guthrie, Marlene F. Wilson, Lois Jordan, Robert Coleman

EXECUTIVE EDITOR
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ARMY is a professional military magazine devoted to the dissemination of information and ideas relating to the military art and science representing the interests of the entire Army. *ARMY magazine strives to—*

Advance man's knowledge of warfare in the fields of strategy, tactics, logistics, operations, administration, weapons and weapons systems.

Advance man's knowledge and understanding of the soldier as an individual, as a member of a trained unit, and as a member of the whole Army; emphasizing leadership, esprit, loyalty, and a high sense of duty.

Disseminate knowledge of military history, especially articles that have application to current problems or foster tradition and create esprit.

Explain the important and vital role of the United States Army in the Nation's defense and show that the Army is alert to the challenges of new weapons, machines, and methods.

Advance the status of the soldier's profession.

—AUSA By Laws, Par. 13 Article II

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THE MONTH'S COVER

Some twenty years ago *Lachlan M. Field* submitted a drawing of a World War I fighting man to Infantry Journal. This stalwart character *sans* spiral puttees and flat helmet comes to life again this month on our cover. Or, what is more likely, he is the grandson of the earlier fighting man. Colonel Field, a field artilleryman on active duty, thinks the American fighting man is the best possible subject an artist can have.

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THE MONTH'S MAIL

Battalion is Military

● I agree with Major General John W. Morgan ["Comments on the Regimental System," September] when he says "call them battalions."

"Group" has no military meaning whatever, and could mean almost anything: people in church, plants in a garden, or hoodlums prowling the streets at night. In my opinion, it has no business as a title for a unit of fighting men. "Battalion" calls to mind at once something military that "group" could never do. If "battalion" is so obnoxious to present-day units, let's go back to the days of the Old Army and call it a "legion," but never such a meaningless word, from a military standpoint, as "group."

I also agree with Colonel Juskalian's "Give the Corporal Back His Squad" [May]. I am very much in favor of restoring the rank of buck sergeant and making first sergeant the rank it used to be instead of a duty assignment I understand it is now. First sergeants handled their companies successfully when they had fifty men or less as when they had two hundred and fifty. I don't understand why the rank was abolished.

Congratulations to *ARMY!* It gets better with every issue.

CAPT. K. F. BOWEN

Erie, Pa.

Don't Underrate Our NCOs

● During the many years that I have been reading *ARMY* and its predecessors I have noticed an increasing lament among readers about inefficient noncommissioned officers, and ideas for improving the situation. I would like to recount my experience at last summer camp which might help show that not all noncommissioned officers are inefficient. I was in a basic training company of young enlisted reservists. Besides three officers, we had five sergeants, all fresh from civilian life. Naturally, I took a dim view of any success since we were short of equipment and time, and none of the cadre had ever seen one another before.

I can truly say that the complete success of those two weeks was due in great part to our noncommissioned officers. On active duty I had met some of the other kind, but these sergeants got up at 0400 and turned in at midnight. They gave our recruits the guidance and discipline they needed. If demonstrations were required, these sergeants had it—no questions asked. They scrounged training aids out of natural materials, and evening classes were held in subjects not covered in daytime training.

We *do* have excellent noncommissioned officers, and although criticism and efforts at improvement are good, efforts should be made to recognize these outstanding men.

Lieutenant Allan Felsen, in his letter in the September issue, says more efforts should be made to commission outstanding noncommissioned officers. The idea is very commendable, but since when has the road to commission been barred to enlisted men? West Point has always been open to the ranks. Lieutenant Felsen also thinks some steps have been taken by OCS to remedy a "caste system." If he would check, he would find that OCS goes back to 1914. Correspondence courses leading to a commission are available, not to mention direct commissions and warrants. So far as I can determine, the only barrier to commissioning outstanding enlisted men is certain age limits which are not, in my estimation, always valid. I have known too many officers who rose from the ranks to feel that any caste system exists that discriminates against enlisted grades.

LT. ROBERT W. CEDER

Indianapolis, Ind.

They are Land Forces

● I have never heard of "water forces," and I don't expect to. The Navy is rightly proud of its traditions and past accomplishments that go back almost as far as those of the Army. When we refer to its elements, we say *naval forces* or *sea forces*. The importance of controlling the seas and of the forces necessary for exercising that control is widely acknowledged. Yet, control of the seas is important mainly because of the economy and flexibility of sea transportation which links bodies of land. Man lives on the land, and from it he obtains food, fuel, and the means of combating his fellows.

The term *ground forces* originated during World War II when the Army was divided into Army Air Forces, Army Ground Forces, and Army Service Forces. After the war, the air element became independent, and of course dropped the *Army*, but that is no reason why we should drop it, nor should we be stuck with the appellation *ground forces*. The service forces were integrated back into the Army, so we no longer have that distinction to contend with.

Army means something to America, not only because of its long history, but because a major portion of its male population has served in it. In spite of the usual soldier gripes, most ex-Army men I meet are proud to have been part of it. Our role in civilian disasters shows that our people have a profound respect for the Army, and turn to it in time of trouble. There is no corresponding respect or approval for *ground forces*, which distinguishes the earthling from the airman whose glamor is widely publicized. So let's say "Army" whenever we can; if we must use "forces" let's say *land forces* instead of *ground forces*. If we do this in *ARMY*, in official publications and press releases, and perhaps even in Department of Defense documents, eventually the newspaper fraternity will follow our lead.

COL. T. H. LIPSCOMB

Arlington, Va.

Helmets and Chin Straps

● In "Wear Your Helmet Anchored" [September] Colonel Cawthon suggests keeping the helmet chin strap buckled during combat. He says that a close shell blast will not break your neck. Maybe he is right, but it wouldn't be difficult to check the theory with dummies and a few HE shells.

A good reason for dispensing with the chin strap was demonstrated during the 77th Division's action on Okinawa. Due to the peculiar behavior of bullets, it was not unusual for a soldier to be hit squarely on the helmet and survive with only a headache or maybe a close haircut. A bullet hitting the front at the forehead quite often penetrated and ran around between the steel and the liner until it reached the downward curve at the back. Then it would break out, leaving a jagged tear. The steel would bulge outward where the bullet ran around. Study of the direct line between points of entry and exit caused many

a soldier to bless the helmet's design. At impact the helmet would fly off one's head. Doesn't that suggest that had we worn chin straps there would have been some broken necks?

I saw one soldier take a direct hit over his left ear from a sniper's bullet. The hit was at close range and at right angle to the helmet's surface. The helmet flew one way and the soldier dived in another. When he came out of it he found himself with a sore head but no other damage. The helmet was dented, not penetrated, and was partly flattened so that the measurement from ear to ear, so to speak, was less than six inches. This soldier probably was very glad he didn't buckle his chin strap. However, what happened demonstrates the probable behavior of the helmet if hit from that angle by something blunter than a shell fragment.

It always seemed to us that the very looseness of the helmet sitting unstrapped on top of the head encouraged bullets to deflect.

If the chin strap is not worn buckled it should be tucked away securely. If it hangs loose any sort of blast will make it flop around with enough force to draw blood and possibly damage an eye.

So far as we on Okinawa were concerned, the only thing wrong with the helmet, when worn loose, was the rain that dripped down our necks.

STAFF SERGEANT

Hawaii

• *We turn to professional evidence. Lieutenant Colonel (then Captain) Douglas Lindsey, Medical Corps, wrote in the July 1946 issue of* Infantry Journal:

"The 29th [Division] wore its chin straps buckled. I was a battalion surgeon . . . and I do not know of a single man hurt because of a buckled chin strap. I know a lot who would have been worse off if their helmet hadn't stayed on. What kind of a shell has such a terrific blast and no fragments? If you're that close you're chopped up too badly to worry.

"One soldier in my battalion received a direct hit *with a German artillery shell. Of course, he's no longer alive, but the point is that his platoon was marching in* close order. *The men on either side of him were pretty well scratched up, but their helmets stayed on, their heads were intact, and they didn't even complain of a sore neck, much less a broken one. And that one 'came in close.' Another instance—two soldiers were entering their cellar bivouac when a shell dropped into it. One had his chin strap buckled; the other did not. The concentrated blast coming up the cellar stairs threw them around a bit. The man with the buckled chin strap hit the wall with his helmet. He shook himself, picked up the other, who had hit the wall* sans *helmet, and carried him, unconscious with a skull fracture, to the aid station.*

"Which one was the smarter soldier?"

In the August 1947 issue of Infantry Journal *Colonel Lindsey added this comment: "When I say I know of no [chin-strap injury] cases I do not limit myself to six months with the 29th Division; through Medical Department colleagues in many other units I know of no such cases. . . . If anyone knows personally of an authentic and unequivocal case, I would be interested to receive the details, and I am sure that the Surgeon General's Office would like me to transmit the data to them."*

When we received the Staff Sergeant's letter we got in touch with Colonel Lindsey at the Army Medical Center in Washington. He told us that the Army Medical Corps has no information that would lead him to reconsider in 1957 what he had written in 1946.

THE EDITORS

• "Keep Your Head, Keep Your Helmet," by Norman A. Hitchman [September], was good clear to the final paragraphs. There it fizzed out. Why didn't the major portion of the soldiers in Korea wear their pots during the first of the winter campaigns? One of General S. L. A. Marshall's reports tells why: winter hats and helmets didn't go together. If there was a choice, the soldier usually chanced the potential head wound rather than the certainty of frozen ears. How can this be corrected?

The M1 pot will be with us for some time, so it might be worthwhile to apply two solutions. Neither is original with me, but I haven't seen them suggested for military use elsewhere.

The first can be applied as a modification or a field fix. For many years some fire helmets have had attached flaps, and late models have zippers. A flap of heavy cloth can be used, with elastic chin strap, attached to the liner by snaps, or to a zippered tape cemented to the liner. Not fancy, but it works on cold days.

Secondly, a molded plastic foam liner can be made for cold climates. We see these around kiddie counters in the form of space helmets. The outer form can have the shell contour, and could be made in several sizes. Some of the plastic foams have superior shock resistance and can be used to good advantage. With the steel shell worn over it, it should give warmth and protection.

Our old reliable solution has been to design a cap to wear under the helmet. None has ever been worth a hoot, except the little wool cap associated with the late Ernie Pyle. It used to bring about fifty bucks in Third Army areas. Let's

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go forth in gourd protectors that amount to something.

SGT. VON LACKWITZ

Newark, Ohio

Initiative of Commanders

● Two articles in the August issue struck me as most worthy sequels to Colonel Collins's article in the January 1957 issue: "Leave the Troops Alone" by Colonel Eben Swift and "Let the Company Commander Promote" by Captain Thomas C. Clary.

As a recent antiaircraft group commander I am most heartily in accord with them.

All those who have been laboring under these pressures should write to you and support the principles for which these officers are fighting.

COL. J. R. SEWARD

Fort Totten, N. Y.

● Colonel Swift knows what he is talking about. Having been a first-three-grader since 1941 and having spent a little more than ten years here in different types of combat units as first sergeant, I know how most noncommissioned officers feel about training. There is just not enough time, and in some cases the M1 pencil goes to work—and not only the one Colonel Swift writes about.

It's high time this business was stopped and we professiond soldiers must do something about it.

FIRST SGT. Ross MCGHEE, JR.

APO 696, NY.

● I sincerely wish that I could shake Colonel Swift's hand and thank him for a job well done in "Leave the Troops Alone." Having been an infantry company commander, I can recall many awkward situations into which I was forced by higher commands. For one thing, the constant harassing and always increasing load of paperwork will bring any conscientious officer to his knees begging for reassignment.

Again my sincere thanks for a very fine and factual article on the problems that daily face the majority of company, battery and detachment commanders.

MSGT. GEORGE E. OMEN

Aberdeen PG, Md.

Better than TV

● I'm getting Extension Course happy. I hate to quit my current problem. I find myself putting aside my usual reading so I can go back and join up with the 10th Infantry in the spot where I left it last night. I get excited as the situation develops, as friendly troops are fired on, our tanks are set ablaze, and our soldiers become casualties. But like in TV Westerns where the good guys always win, the 10th Infantry secures its objective. That's as it should be: a good story with a happy ending.

After the lessons are bundled up and sent off to TIS, I begin to sweat out my grades. I watch for the postman so I can tear into the solutions. Should I have moved team Charlie to the vicinity of team Bravo and launched a coordinated attack? Or should I have allowed team Bravo to contain the Aggressor force while I requested permission to by-pass team Charlie around the strongpoint to continue the attack to the east? I learned by reworking the unsatisfactory lessons. I really have to dig the second time, but by then my chances have improved. Only three possible solutions left now. Sometimes, with a familiar subject, I work on a lesson without referring to the text, just to see if it can be done. I've worked as fast as one lesson per night (two-hour period), and I have taken four months to complete one subcourse (that was Drainage, TES). I worked one that read like a MacKinlay Kantor novel. I get so much official mail people must think I'm either a G-man or a National Guard general.

I've been at it for five or six years now, and it gets better all the time. Long live the Extension Courses Program! It helps keep me satisfied with my civilian lot.

SGT. JACK ACLIN
NGUS

Paris, Tenn.

Sure-Fire Bayonet Training

● Captain Harlan G. Koch looks forward in "Bayonet Training—M1905?" in the September issue. The arguments he puts forth on realistic bayonet training are sound. Captain Koch can be assured of strong support from the Marine Corps.

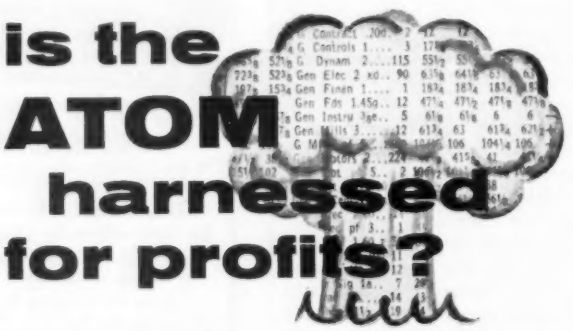
The Marines began using the Seidler system after lengthy tests, and now it is *the* method of bayonet training throughout the Corps. After seeing it used and noting the tremendous aggressive spirit it instills and its ready application to close combat, we bought it, and quick.

The pugil stick is very simple to make. It has the relative size of the M1 rifle and two sponge rubber ends covered with canvas. Add a football helmet or tin hat, and a groin guard, and you're in business.

I know the Army always seeks means to instill real aggressiveness in its troops. I'll guarantee that this type of bayonet training is a sure-fire cinch to fire 'em up.

CAPT. J. W. DUNCAN
USMC

Columbia, SC



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VEN

CONTROL STABILITY

To prove the stability of the T58's controls and their responsiveness to a helicopter rotor system, General Electric has subjected the T58 to over 150 hours of tests on this rotor stand. Despite throttle bursts and sudden collective pitch increases, the engine's control system kept power turbine speed loss to as little as 1%! At the same time, the gas generator and power turbine regained efficient operating speeds as fast as 4 seconds! Here, certainly, is proof that the T58 can provide extremely accurate rotor-speed command, more efficient helicopter operation.

POWER SPLITTING

The T58's excellent power-splitting ability makes twin-turbine-powered helicopter flight truly practical. Dual engine runs show the T58's control (1) automatically proportions output of both engines, at any collective pitch setting, (2) allows full military power to be drawn from both engines, (3) holds power differential between engines, at all collective pitch settings, to a minimum, (4) virtually eliminates manual rotor speed adjustment, (5) prevents excessive engine or rotor speeds. General Electric Company, Section 233-8 Schenectady 5, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC

FRONT AND CENTER

MISSING MUSCLE

Military muscle to be trimmed off to stay within the $38 billion budget ceiling imposed on the military services will include at least two and two-thirds Army divisions, the inactivation of a number of air defense battalions, five Aviation Construction Engineer battalions, and reductions in strength of other units. The 2d Infantry Division has been inactivated and the merger of the 24th Infantry Division into the 1st Cavalry Division is being effected. One armored division in the U. S. will be reduced to combat command strength.

When these reductions are completed the Army will have three armored divisions, three airborne divisions and nine infantry divisions, many at less than full strength. Two infantry divisions will be in Korea, one in Hawaii, two in Europe, and four in the U. S. Two armored divisions will be in Europe and one in the U. S. One airborne division will be in Europe and two in the U. S. Alaska will be defended by two battle groups and Panama by one.

In the shadow of a Redstone missile with which it will be armed, the 40th Field Artillery Missile Group (Heavy) was activated during ceremonies at which Maj. Gen. John B. Medaris presented the colors to Col. Robert C. Gildart who commands the Group. The event took place at Redstone Arsenal, Ala.

HOW THOROUGH AN INQUIRY?

When the turmoil and shouting over the Soviet satellite abate, it may be that the nation will attempt to assess with some objectivity the meaning of the achievement and its effect on the U. S. defense program and our position as a leader of the free world.

Is it not long past time when we can afford to be complacent and self-assured about our scientific and technological superiority? Sputnik came hard on the heels of Soviet assertions that they had fired an ICBM.

Have we not been mistaken in assuming that scientific progress has little to do with the propaganda war we are waging with the Communists?

Can we longer maintain that scientific programs in fields that have a clear military application can be separated from military research and development? One instance of the weakness of such compartmentalization is that the U. S. might have had the first earth satellite if it had used the Army's Jupiter system—which had fired higher than the claimed 560 miles of Sputnik.

At the time this was written it appeared that Sputnik had shaken the nation out of its complacency and that an examination of the U. S. missile program was being undertaken by the executive branch of the government.

Members of both parties of the legislative branch spoke out, too. Senator Mansfield, a Montana Democrat, said that he wanted an investigation of why the Army's Jupiter was not used in the satellite program. Senator Case, a New Jersey Republican, suggested that tailoring defense spending to budget cloth was living in a "fool's paradise."

A 3d Infantry Division Medal of Honor Winner in World War II, Major Charles P. Murray, presents a Nazi Swastika he "liberated" in Munich in 1945 to Major General Roy E. Lindquist for display in the Division museum. Both Major Murray and General Lindquist are preparing to leave Fort Benning. Major Murray will attend the Canadian Army Staff College and General Lindquist will lead the 3d Division to Germany where it will replace the 10th Infantry Division

The latter comment indicated an awareness of the fact that defense is more than missile development and that it must be considered as a whole. In an editorial on 14 October *The New York Times* recognized this and noted that such questions as these needed answers:

"Are we devoting the maximum possible amount of national resources to assuring that we have at least parity with the Soviet Union in missile development?

"Dare we cut our already shrunken conventional forces to provide resources for research and development of a weapon which at best can be available in quantity only some time in the future?"

Answers to these and other allied questions could come only during a thorough inquiry into defense plans and policies. An investigation limited to missiles only would achieve inconclusive results at best. The experience and results of the hard-working Symington subcommittee's investigation of air power in 1956 give validity to this conclusion.

Secretary of Defense Neil J. McElroy with his predecessor, Mr. Charles E. Wilson, in the Office of the Secretary of Defense a few days before Mr. McElroy took over the reins

M14 AVAILABLE FOR DEMONSTRATION

The Springfield Arsenal can loan a few of its new M14 rifles for demonstration at large Army garrisons such as branch centers and schools, training centers and at posts housing Army divisions. Application may be made directly to Springfield Arsenal, Springfield, Mass. Under present schedules, the M14 will not be generally issued until 1960.

FIRST WEATHER COMPANY

The Army's first Meteorological Company has been organized at Fort Huachuca, Arizona, site of the Signal Corps' electronic proving grounds. The unit, made up of 240 officers and enlisted men, will be divided into nine teams located at Fort Huachuca, Yuma and Gila Bend, Ariz.; Dugway, Utah; Fort Monmouth, N. J.; Natick, Mass.; Mount Washington, N. H.; Panama; and Greenland. In addition to their military meteorological duties, the teams will participate in the International Geophysical Year.

In what is becoming a ritual with every change in the Joint Chiefs of Staff, the nation's top military planners pose about a globe. For the record, from left to right, they are: Gen. Thomas D. White, C/S USAF; our own Gen. Maxwell D. Taylor, C/S USA; Gen. Nathan F. Twining, Chairman; Adm. Arleigh A. Burke, CNO; and General Randolph McC. Pate, Comdt, USMC

AUGMENTATION PROGRAM

A list of 403 officers who have been selected for appointment in the Regular Army under the augumentation program was announced early in October. Two more lists will be published before the first of the year, one for first lieutenants and captains with less than 10 years of service, and the other for captains and field officers with more than 10 years of service. These are all recess appointments, approved by the President, but subject to confirmation by the Senate. One or two more lists of officers selected for Regular Army commissions will probably be published in 1958.

MANPOWER DOWN

In the month of August Army strength declined 8,855 and dropped below a million to 992,413. During the month 7,227 soldiers reenlisted. Navy strength de-

clined 9,690 during the month and the Marine Corps lost 1,206. Only the Air Force showed a gain: from 920,760 to 922,249.

TUITION ASSISTANCE

Commissioned officers who receive tuition assistance for voluntary off-duty courses studied at accredited civilian schools during FY 1958 must agree to remain on active duty for two years after completion of the courses. Also the maximum of tuition assistance for all ranks and grades is limited to 75 per cent of the cost of the course, with a maximum of $7.50 per semester hour and no more than six semester hours for a 16- to 18-week course.

JET TESTS

Fort Benning is preparing to test the feasibility of using jet aircraft for observation and reconnaissance missions. Called "Project Long Arm," the test will include L-19 Army aircraft and USAF T-37 jets. Test Director is Maj. Gen. Herbert B. Powell, Commandant, USAIS.

An Army H-34 helicopter carrying a 105mm howitzer flies over the placid German countryside near Goppingen, symbolizing the modernization program of the Seventh Army

MISSILE MASTER SHIFTS

The school operated at Fort Meade, Md., by The Martin Co., to train Army Missile Master crews will be moved to Orlando, Fla., after the first class of 100 officers and men concludes its course. Orlando is the site of a new facility built by Martin within the past year. The Missile Master system of firepower control and coordination is used by all Army antiaircraft missile weapons, including Nike-Hercules, Nike-Ajax and the Hawk.

GENERAL OFFICER SHIFTS

Lt. Gen. CHARLES E. HART to USARADCOM . . . Maj. Gen. JOHN W. BOWEN, to ACofS for Reserve Components . . . Maj. Gen. PHILIP D. GINDER to First U.S. Army . . . Maj. Gen. HAMILTON H. HOWZE to 82d Abn Div . . . Maj. Gen. EDWARD H. McDANIEL to OTIG . . . Maj. Gen. LLOYD R. MOSES to USAREUR . . . Maj. Gen. JOHN C. OAKES to ODCSOPS . . . Maj. Gen. ROBERT W. PORTER, JR., to ODCSPER . . . Brig. Gen. CHARLES H. BONESTEEL, III, to OACS . . . Brig. Gen. FRANK H. BRITTON to OCRD . . . Brig. Gen. FREDERICK W. ELLERY to Eighth U.S. Army . . . Brig. Gen. OLAF H. KYSTER, JR., to UN Military Armistice Commission, Korea . . . Brig. Gen. HAL C. PATTISON to OTAG . . . Brig. Gen. RICHARD STEINBACH to Deputy Chief, MAAG, Germany . . . Brig. Gen FREDERICK G. WAITE to OCORD.

Retirements—Maj. Gen. GEORGE B. BARTH . . . Maj. Gen. EINAR B. GJELSTEEN . . . Maj. Gen. ROBERT P. HOLLIS . . . Maj. Gen. WILLIAM H. MAGLIN . . . Maj. Gen. MARK McCLURE . . . Brig. Gen. JACQUARD H. ROTHSCHILD.

Rubber boat that can be inflated within a few minutes and is capable of carrying 15 men when being paddled or nine men when powered by a 25-hp outboard has been developed by the Army's Engineer Research and Development Laboratories. It weighs 255 lbs. with case and paddle and six men can carry it. Twenty of these boats can be loaded in a 2½-ton truck

VTOL

...new dimensions of FLIGHT

BELL Aircraft corp
BUFFALO N.Y.

BELL AIRCRAFT has kept pace with the need for greater operational mobility and flexibility in both military and commercial aviation by developing four basic types of VTOL (vertical-take-off-and-landing) aircraft.

Studies and development work on a ducted propeller prototype have advanced to a point where this new design concept is fast approaching reality at Bell. The X-14 uses new principles of jet propulsion to take off and land vertically with the airframe in a normal horizontal position. The XV-3 convertiplane takes off like a helicopter, but as its rotors tip forward in flight, it becomes a normal, fixed wing aircraft. The XH-40 turbine-powered helicopter has substantially increased speed and payload and the ability to use a wide range of fuels.

The skillful and imaginative type of research which was the forerunner of these projects is being carried steadily forward at Bell Aircraft in the interest of still further scientific advancements in the commercial and military aircraft of tomorrow.

Be sure to visit the Bell Aircraft display at Booths No. 77-80: DURING THE 3RD ANNUAL MEETING, ASSOCIATION OF THE U. S. ARMY. THERE, BELL PRODUCTS AND FACILITIES WILL BE ON EXHIBITION PLUS CONTINUOUS MOTION PICTURES.

THE LATEST WORD ON . . .

- *Nuclear Weapons & Army Capabilities*
- *Military Compensation*
- *Sword & Shield of NATO*
- *Military Automation*
- *New Role of Reserve Forces*
- *Report on CONARC*
- *Army Missiles in Air Defense*
- *Army Achievements in 1957*

will appear in the December issue of

ARMY

in its report of the full proceedings of the 1957 Annual Meeting of your AUSA

You won't want to miss this issue

THE ARMY'S MONTH

A recent recipient of the Soldier's Medal, Sergeant David E. Bolton, saved a fellow soldier's life in an airplane when a parachute got loose in the craft's slipstream and threatened to smash the soldier against the door frame. Sergeant Bolton threw himself on the soldier to protect him and at the same time managed to cut the shroud lines. He is a member of CONARC's Airborne and Electronics Board at Fort Bragg.

Among the most constructive actions taken to help officers being "riffed" during the present economy wave was that of First Army which established a placement service to help them find positions in private employment. Maj. Gen. Robert Booth, First Army's Chief of Staff, wrote letters to many large employers in the New York-New Jersey-New England area telling them of the availability of first-class men and asking them to state their needs. Among early responses by industry to the announcement of the release of officers was the request of an oil company in Texas for 15 helicopter pilots.

The injustices to individuals in forced separation has been editorialized upon by a number of leading newspapers. The Scripps-Howard chain published stories on the subject written by Jim G. Lucas. An editorial in *The Milwaukee Journal* noted that whereas the British are making a programmed reduction of their forces and have organized boards to help find employment for officers and men being relieved, the treatment accorded U. S. officers has been "cavalier." "Only a few years ago the Army was pleading with reserve officers to return for Korean duty and to stay in active service. An officer with a good record—and these men have good records—naturally felt secure. Now with the Army bearing the brunt of a 200,000 man military cutback, the officers are turned out," the *Journal* said. Unfortunately the editorial misplaced the blame on the Army instead of on those who directed the Army to do it.

Some 170 field grade officers from infantry, armor and artillery arms will attend the Cold Weather and Mountain School at Fort Greely, Alaska, for arctic warfare training, CONARC has announced.

The 3d Infantry Division, now at Fort Benning, Ga., but preparing to move to Germany, is creating a 3d Infantry Division War Trophies display and is anxious to acquire paintings, photographs, maps, flags, captured weapons and equipment or other items that have special historical significance to the 3d Infantry Division. Materials or inquiries should be addressed to Major General Roy E. Lindquist, Hq., 3d Infantry Division, Fort Benning, Ga.

At Fort Meade, Md., Wacs have been assigned to antiaircraft units in a test of the possibility of using them at Nike sites. They'll be used in radar detection and tracking duties mostly. It will be recalled that British women were assigned to AA units during the Blitz.

Two Signal Corps soldiers on Fletcher's Ice Island, a 10-mile-long fragment of shelf ice not far from the North Pole, made early contact with the Soviet satellite and relayed their trackings to IGY headquarters. The men —Sp3 Clarence W. Nash and Sp3 Donald L. Stuckwisch—are on Fletcher's Ice Island to make special studies of communications near the North Pole for the Army Signal Corps Laboratories. Other contacts with Sputnik were made by the Army Signal Corps' new high-power direction finder radio at Fort Monmouth.

A new Beach Discharge Lighter used in over-the-beach operations was named the Lieutenant Colonel John U. D. Page at ceremonies at San Diego, attended by Major General Paul F. Yount, Army Chief of Transportation, and the widow of the late Colonel Page. A "retread" in Korea, Colonel Page earned a posthumous Medal of Honor.

The "Futurarmy" painting by Lt. Col. Robert B. Rigg which appeared on the November 1956 cover of ARMY and was used so effectively at the 1956 Annual Meeting is still getting a good play in the press. In recent months full color reproductions of it have appeared in St. Paul and Louisville newspapers. These reproductions were made from the large "blow-ups" of the figure prepared by the Army Exhibit Unit for showing throughout the country.

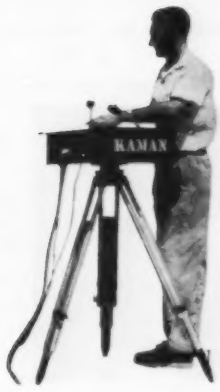
Economy has closed down two facilities at Fort Carson, Colo., hard on the heels of the deactivation of the pack mule outfit that supported the previously deactivated 4th Field Artillery (Pack) Bn. These are the Army Dog Training Center and the Mountain and Cold Weather Training Command.

World's First Unmanned 'Copter

The successful maiden flight of Kaman's pilotless helicopter has added a new concept to military strategy. Flown entirely by remote control, the variety of missions possible with these ships is almost limitless. Using the Kaman robot as a flying TV or motion picture camera, complete battlefield surveillance and target marking are available without hazard to personnel. Also possible is the entry of the robot helicopter into contaminated or hazardous areas.

The control station is portable and can be operated from the ground or in air to air operations. Mission equipment such as cameras, weapons, target markers and detonators can be actuated at the control station.

Kaman is proud of this forward step which has been taken in behalf of our National Defense effort.



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THE KAMAN AIRCRAFT CORPORATION
Bloomfield, Connecticut

The Risks of Reductions

JOHN SLEZAK

PRESIDENT, Association of the U. S. Army

ONE year ago when the Association of the U. S. Army was holding its second Annual Meeting the attention of the World was divided between Hungary, where an oppressed people were in revolt against their harsh Soviet masters, and the Middle East, where events arising out of President Nasser's seizure of the Suez Canal were approaching an ominous and unpredictable climax.

At the time of the AUSA meeting it appeared that the enigmatic masters of the Kremlin might be inclined to give a barely tolerable measure of Communist style relief to Hungary. I mention this because I will not soon forget that the correct turn was called by a participant in the panel discussion on the last day of our meeting. It was Brigadier General S. L. A. Marshall who said that the slightest hint of moderation towards Hungary by the Soviets would send a tremor of hope throughout the whole Soviet empire and this the Soviet rulers could not countenance. The Kremlin, General Marshall said, would use the Soviet Army to put down the revolt in Hungary because it wouldn't dare not to do so. How right he was, a sickened world soon learned. A few days later the blood of Hungarian freedom fighters was running in the streets of Budapest and the flesh and bones of brave men were being crushed by Soviet tanks.

* * *

At the suggestion of General Weible it is my purpose here to consider briefly some aspects of the state of the nation's security and the condition of the U. S. Army as they appear to me after a year as President of the Association of the U. S. Army. I have mentioned the events in Hungary and the Middle East because it is always necessary in any consideration of the nation's security to be very much aware of the acts and, insofar as we can determine them, the intentions of our Communist enemies.

I can find nothing in the events of the past twelve months to lead me to believe that the Communists have changed in the slightest degree. Their deviousness during the long months of the London Disarmament Conferences, their meddling in the Middle East and in other parts of Africa and Asia demonstrate that the objectives and the ways of the Kremlin are unchanged. They seek always to divide and weaken. And when they find a weak spot they exploit it. We can be sure that when it suits the Soviet's purpose there will be another crossing of a 38th Parallel by the armies of some satellite. And it follows, I am convinced, that there will be another long and frustrating conflict such as Korea unless we have the capability to punish the aggressors and put down the aggression quickly.

* * *

It is that capability that I want to consider here.

I am quite certain that we do not have as much capability to deter and wage a limited war as is desirable. I find myself in agreement with General Taylor's recent observation that "to cope with lesser situations, we will need considerably more than the atomic retaliation force" of our Strategic Air Command.

Mr. John Slezak, an industrialist, lives at Mount Morris, Illinois, where he serves as Chairman of the Board of the Kable Printing Company. A former Assistant Secretary and Under Secretary of the Army (May 1953 to January 1955), Mr. Slezak served as an enlisted man in the Army during the First World War, earned a reserve commission after that conflict, and was called to duty early in the Second World War by the Ordnance Department. He served with the Army-Navy Munitions Board and the Chicago Ordnance District, and was a Colonel when he left active service in 1946. He became Chairman of the Reserve Forces Policy Board on 3 October, succeeding another member of the Council of Trustees of AUSA, Lieutenant General Milton G. Baker.

The deterring and waging of limited conflicts is primarily a mission of the Army. Neither the Navy nor the Air Force can exert more than peripheral pressure without running the exorbitant risk of loosing the holocaust of total nuclear conflict. And so when I say that we do not have as much capability in this respect as would be desirable, I am thinking of the U. S. Army.

This was true, as I am sure all members of our Association know, even before the recent reductions in force were imposed on the Army. I cannot believe anyone would seriously maintain that the losses of 100,000 officers and men by the end of this fiscal year will not reduce the Army's combat potential. Evidence that this is inevitable appears in the Army's announcements of the organizations that are to be inactivated in order to make these reductions in force. Two infantry divisions have been or are in the process of being inactivated and one armored division is to be reduced to a combat command. Where the Army had eighteen combat divisions a year ago, in a few months it will have only fifteen. This reduction of sixteen and two-thirds per cent in division strength is not the entire picture since a large number of antiaircraft artillery and combat support units are to be inactivated.

* * *

This reduction in strength is of concern to me, as I think it should concern every American citizen. But at the same time I try to keep my perspective and as I think over the events of the past year I cannot help but be impressed with the progress the Army has made under trying conditions. As an industrialist I know what the lack of money can mean to a struggling young business in need of capital for expansion, to a college in need of additional endowment, and even to a government agency that has a constitutional obligation to protect and preserve the United States. And so I can appreciate the feelings of General Taylor when he good-humoredly speaks of the "illusions and disappointments" he has experienced as Chief of Staff because so much of his time is taken in an "overwhelming preoccupation with the Army budget."

I know he knows it, but I want to reassure General Taylor by telling him that while he has been grubbing away in budgetary thickets his Army has been going great guns.

A year ago "Pentomic" hadn't been coined so far as I know. And yet today our Army has transformed a number of its infantry and airborne divisions into this new and quite revolutionary organization. It is just in the past year, remember, that the Army has quit talking about infantry regiments and now speaks of Battle Groups, Army Missile Commands and U. S. Army Air Defense regions. Perhaps this is largely semantics, but it indicates to me that the Army has travelled far in its modernization.

I have been speaking of the combat army which is smaller than it should be, but is second to none in those qualities that make a peacetime Army a force ready for battle. But I also must say that I am impressed too at the progress of Army hardware. To me the number and variety of Army missiles is truly amazing. It is only in the last year or so that the American public has become familiar with the names of such missiles and rockets as Dart, Hawk, Lacrosse, Corporal, Honest John, Nike, Hercules, Redstone and Jupiter. It is my distinct impression, and I am confident a correct one, that the Army's missile development program will become a classic example of brilliant military research and development.

This feat is not only a credit to Army Research and Development but is an achievement of all of the Army agencies and technical services. I have no desire and I certainly am not qualified technically to engage in the so-called inter-service controversy over missile developments, but I do know that the Army has more than enough brains and technical know-how to provide the bewildering array of technical and logistical support these missile weapons obviously must have. I have never felt that the Army, even on what some of its members seem to consider the black day of 26 November 1956, had much to be worried about. In my experience, class and performance always tell. I have seen enough of the U. S. Army in two wars and a tour of duty as a civilian official in the Pentagon to know that it has the class and performance.

* * *

I especially regret the financial strictures on the Army when I think of how this is affecting the lives and prospects of a large number of able, loyal and patriotic officers who find themselves being almost summarily relieved from duty after many years of service. I regret too that this stringency has apparently derailed action on new compensation programs for people remaining in the service. I am convinced that a program such as that advanced by the Cordiner Committee is necessary and I trust it will not be long delayed.

I have an especial interest in our Reserve programs and I deeply believe that our reserve forces constitute a line of defense for which there is no substitute. Thus it must be kept strong and healthy, fully capable of supporting the requirements of national strategy.

* * *

I want to re-emphasize in closing what I said earlier: that there is absolutely no evidence that our Communist enemies have changed in the slightest. I am greatly concerned that we are reducing our military strength in the very face of Soviet refusal to accept the very moderate and fair disarmament proposals we made to them in London. As I said earlier, the Kremlin looks always for a weak spot, and the knowledge that the United States is reducing its capacity to deter creeping aggression may, I very much fear, encourage them to undertake another Korean-type aggression. And in such an event will we not find ourselves much in the same condition that we found ourselves in 1950? That the answer is yes, should be disturbing to every American.

Getting them there

- on the button
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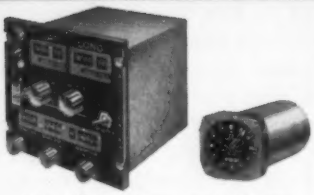
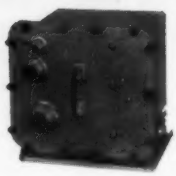
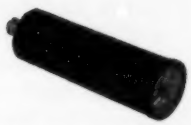


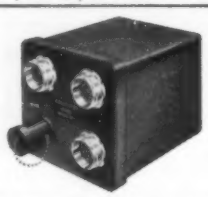
FICo ASN-7 Course and Distance Computer System — indicator and control are shown. Can be provided with polar capabilities.



FICo Viewfinder Computing Timer — controls up to five aerial cameras simultaneously. Highly compact.



FICo Exhaust Temperature Indicator — range 200°C to 1000°C with ±5° accuracy. 6″ long x 2″ diam.



FICo Wind Memory Computer — an aid when navigational systems operate with Doppler.

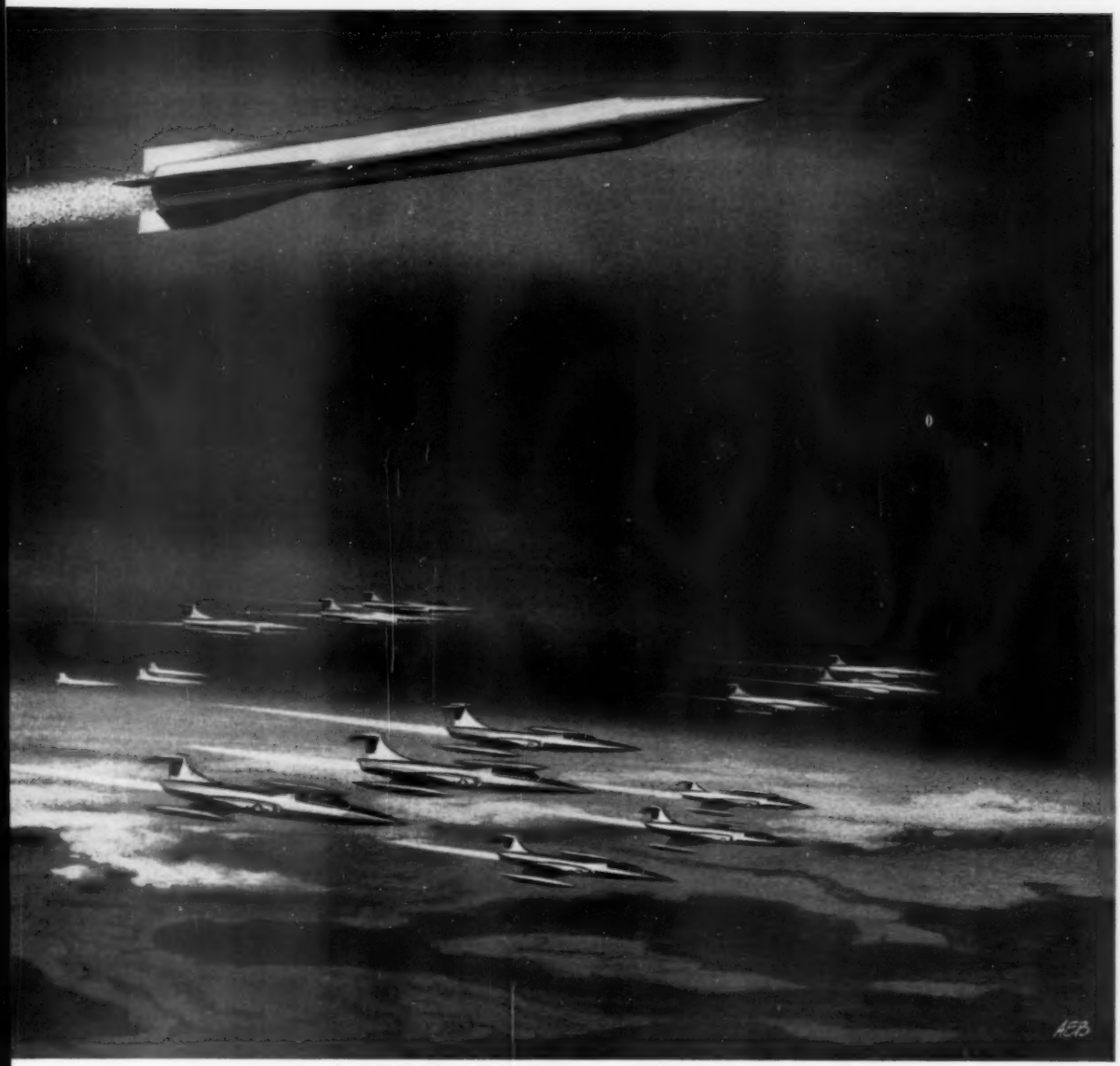
FICo Magnetic Variation Computer — precludes need for manual correction in aero navigation.

FICo ASN-6 Present Position Computer System — indicator and control are shown.

No missile systems can be illustrated because of the level of classification. FICo is doing extensive work in ABMA's Redstone and Jupiter programs, in the Navy's Tartar and Terrier programs, and in other projects.

FICo Test Set — for flight line check out of navigational system. Self-contained and portable.

FICo Analog-to-Digital Converter — for airborne sensing system for traffic control.



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The battle commander's principal primary task used to be the training of units. But new conditions now require that he concentrate on the development of subordinate

LEADERS WHO WILL LEAD

LIEUTENANT GENERAL REUBEN E. JENKINS

Illustrated by GIL WALKER

TRAINING for combat has been a principal responsibility of the commander since armies began and it followed as a logical consequence that the training of his unit was the leader's *personal primary task*. That principle grew out of older and simpler means and methods of waging war and until Korea it was generally accepted as sound by almost all commanders. During the Korean conflict many commanders began to question its correctness and today leaders who understand the problems of the future fully appreciate that, under modern concepts, that doctrine is as antiquated as the Model T Ford, and in any foreseeable war will serve a commander about as well as a band transmission in a 1958 Fireball Flyer.

The principal responsibility for the training of a unit still rests squarely on its commander. But if he still believes the training of his unit is his *personal primary task*, he doesn't appreciate the nature of future battle and unwittingly is suggesting that he thinks he can do what will be physically impossible on the nuclear battlefield.

The personal primary task of today's commander is to train *his subordinate leaders*—all of his commissioned officers if he has a unit of battle group size or larger, and *all* of his noncommissioned and commissioned leaders if his unit is smaller than a battle group. If he does this job properly, his subordinates will train the men they lead as *their* personal primary tasks.

To examine the proposition that a commander's personal primary task is to train his subordinate leaders, we must understand the vast changes that have come about in the means and methods of combat.

Tight formations displayed shallowly and narrowly

The weapons of the first World War were few and comparatively simple, and in general their efficiency was low compared with today's. The weight of numbers of men deployed in comparatively tight battle formation was the principal source of fire power and maneuver shock. Speed of action was limited to the rate of advance of the foot soldier. Usually, a rifle platoon deployed for combat on a frontage of from 125 to 150 yards, and the platoon leader could control all his squads and reach any of them in seconds. A rifle company's frontage varied from 250 to 450 yards, and its commander could invariably join any platoon in less than five minutes. The 1,000 men of an infantry

Lt. Gen. Reuben E. Jenkins, who enlisted as a private in 1917 and was commissioned in 1918, has had approximately twenty-three years of command duty, most of it in the infantry. During the Second World War he was Deputy G3 of MTO and of 6th Army Group. He served as advisor to the Greek Army during the guerrilla war of 1948-49, was G3, Department of the Army, in 1951-52, and commanded U. S. IX Corps and X Corps Group (ROK I, II and III Corps) in Korea, from August 1952 to October 1953. He was retired in 1954 because of physical disabilities.

battalion normally deployed on a frontage of from 600 to 800 yards, and it took the battalion commander only a little longer to reach one of his companies. A regiment of some 3,000 men usually deployed on a frontage of 1,200 to 1,800 yards, while a division of four regiments usually deployed on a frontage of from 6,000 to 9,000 yards. Regimental, brigade, and even division commanders could and did invariably reach subordinate commanders quickly during an emergency. Comparatively, the depths of these formations were as shallow as their frontages were narrow.

Because of these narrow and shallow deployments World War I commanders knew that they could always arrive on the scene in time to intervene personally if a crisis arose. As a result, the higher commander was less seriously concerned about the quality of leadership of his subordinate leaders than he was with the training and other combat qualities of his units. He believed, sometimes perhaps egotistically, that if a unit were properly trained, he would be able personally to bring some semblance of order out of any chaos resulting from poor subordinate leadership. An untrained unit was definitely considered a greater handicap than a poorly trained leader.

It was quite natural, therefore, for commanders to concentrate on training their units, and to give what little time and effort they could otherwise find to training subordinate leaders. This situation carried over in a very large measure to the Second World War, though with somewhat less emphasis by a few far-sighted commanders.

However, in Korea, even though weapons and other means were in general those of World War II, frontages were invariably much wider, the terrain forbidding, and time-distance factors greatly increased. This led combat commanders to appreciate the vital importance of bold and reliable subordinate commanders. In many instances, the responsible commander, because of the time-distance involved, arrived on the scene to find that disaster had already overtaken him because of errors by an imperfectly trained subordinate. He learned that he could no longer rely on getting to a critical point in time to save it. His chief concern began to shift, slowly but surely, from the state of training of his unit to the quality of leadership displayed by the men who led its elements.

Gone are the days

What of the future? Can we visualize a situation in which a Pentomic division, with its new and varied means and methods, will be deployed for battle on such convenient frontages and depths as prevailed in both World Wars? Of course we can't. We know such deployment would invite destruction. Even the widest and deepest of division zones that we used in Korea will be inappropriate in future war (unless there are guarantees that it will be a non-nuclear conflict, and who expects that?).

Doesn't this suggest tremendously increased problems in communications, command and control? Doesn't it also suggest the vastly increased importance of courage, knowledge, judgment, initiative and vigor of subordinate leaders?

What brought about these greatly increased frontages and depths, with their vastly increased problems? Do they result from any frequently proclaimed, drastic changes in the basic concepts of combat? Or are they the result of weapons which are so destructive that we must now use new methods, not only for survival and for economy of manpower, but to gain more effective use of fire power and battlefield maneuver?

You rarely get something for nothing. And this is patently true with respect to the great advantages gained by increased fire power, speedier combat action, and a more fluid battlefield. For these new means and methods the Army must pay by sacrificing a part of its most

treasured asset: the commander's ability to promptly and effectively communicate, command and control.

We have always had problems in communications, command and control. In the past, commanders have often been confronted with shot-out telephones and dead radios, but until Korea, distances were usually short enough for a runner or mounted messenger to get through in time; even the Old Man could get there himself if he had to. But in Korea, when telephones and radios went out, a runner, a mounted messenger, or the Old Man himself could seldom get there in time to avert a really serious crisis. The subordinate commander, on his own, had to make *all* the decisions and he either pulled the chestnuts out of the fire or burned them to a crisp. A senior commander frequently could get in by helicopter, but more often than not, he discovered that the situation had already deteriorated to the point that it was beyond correction, regardless of who gave orders. Thus the senior commander had to resort to the last effective action he could take and commit a new unit. Problems of command and control of battalions, companies, and regiments at their level, were the same as those of the division commander.

The battle group's fifteen square miles

Visualize an action in a nuclear war with its complex means. The commander of a battle group sees his command dispersed over an area of perhaps fifteen square miles; the nearest battle group is five miles away on a flank; division perhaps seven to ten miles distant; the nearest help five miles away and its movement possibly blocked by nuclear fire; enemy air is raking the command from stem to stern; telephones are out and radios jammed; a determined infantry-armor attack supported by massed artillery and mortar fire grinds slowly but surely away.

The situation is confused; jeep, runner or helicopter must cross several miles of shelled and air-swept areas if the commander is to communicate or personally visit a subordinate unit. Will the battle group or company commander be able to arrive in time to improve a possibly serious situation? Will either be able to arrive at the right place in time to do many of the vital things his counterpart in the two World Wars almost invariably was able to do with relative ease and under comparable battle conditions?

In such a situation, with what is the battlefield commander of tomorrow most concerned? The training of his unit, or the leadership qualities of the men who command its elements? He knows that an experienced combat commander, a roaring lion, can lead or drive a bunch of trembling lambs. He also knows that the surest way to tie things into a knot is to place a bunch of roaring lions in battle under a trembling lamb who neither knows the score nor has the courage, initiative or judgment to find out what's going on. Again, in such a situation, what is the commander's greatest concern? The quality of his unit or the quality of the men who are leading his elements? The answer is obvious.

How important is leadership?

In "Men—Not Gimmicks" in the August issue of *ARMY*, Brigadier General S. L. A. Marshall says: "There is a pressing danger that the Army, hitching its wagon to a star, may forget to lock the tailgate." This tremendously powerful and informative article clearly and bluntly warns our Army and our Nation not to let our enthusiasm for and confidence in our new and highly destructive means and methods of war, make us overlook the vastly increased importance of the individual soldier—of man—who will remain the fundamental instrument in armed conflict. General Marshall also warns us with equal bluntness that unless man functions superbly under any and all conditions of war as it is now envisaged, all our highly destructive means and all our new methods will be useless.

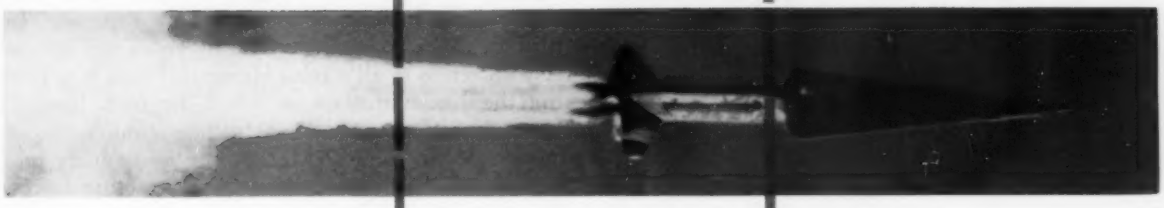
If the importance of the individual soldier has increased a hundredfold since 1917—and most of us believe it has—then the importance of his leader has increased a thousandfold.

Since the current trend toward wide intervals and great distances between units in combat precludes the commander from exercising a possible personal influence during a crisis, he has little choice. Shall he concentrate upon means and methods, or shall he concentrate his personal efforts upon the key individuals while *they* concentrate upon means and methods? The answer is clear: The commander, personally and with a ruthlessness tempered only by sympathetic understanding of his subordinates' problems, must concentrate on developing in every leader of his command those vital, personal, intangible qualities of leadership without which no unit can hope to survive in battle.

By way of emphasizing the importance of this thought in this age of rapid evolution in warfare, we might paraphrase the last sentence of General Marshall's article: When we overrate the products of science, our means and methods, and undervalue the mind and heart of the subordinate leader, we indeed leave the tailgate unlocked and thus bid for oblivion.

A PERCEPTIVE SOLDIER LOOKS AT MISSILES TODAY AND TOMORROW

Why Missiles?



LIEUTENANT GENERAL JAMES M. GAVIN

The beep-beep of the Soviet sputnik broadcast one clear message in the open to all mankind: that the day is not far off when military information "from the other side of the hill" will be available to commanders.

The ever-seeing eyes of orbital reconnaissance vehicles launched into outer space will be able to send back all pertinent information. The soldier on the ground will find many uses for this new instrument —and he will also have to learn how to protect himself from it. Thus we will have not another "absolute" weapon of which to be frightened, but an exceedingly useful tool when made responsive to the requirements of the military forces that shield us from our enemies.

This timely article by General Gavin emphasizes the significant importance of these possibilities.

THE successful launching of the Soviet space satellite and the recent Soviet ICBM announcement cannot be viewed as separate incidents. Together they constitute evidence of what informed Americans have long known: that the Soviets are making rapid progress in adapting missiles to their national needs—and the international situation.

The two incidents also make it clear that the current concern about missiles is realistic and will be with us for a long time to come. This raises the question of what missiles are. The answer lies in understanding what they can do.

Since the dawn of history man has hurled missiles at an adversary in any form in which he could get them: stones, darts, arrows and, most recently, metallic projectiles. Now missiles are more than objects hurled through space with intent to do bodily injury to an enemy; now they portend space travel. The dreams of Icarus, of Greek mythology, may come true. And, like Icarus, whose wings of flight were held together by

Lieutenant General James M. Gavin is, as all our readers must know, the Chief of Research and Development, Department of the Army. A major general and division commander at the age of thirty-five, General Gavin distinguished himself as the commander of the 82d Airborne Division in the Second World War.

bands of wax and thus were destroyed by the heat of the sun, we face certain failure in our search for missiles, and space travel, unless we first solve the technical problems that confront us. But missiles are more than Icarian flights of fancy and technical enigmas.

Currently showing throughout the nation is the winner of five Academy Awards this year, "Around the World in Eighty Days." The opening few minutes are devoted to a film of the early 1900s, depicting the travel of a venturesome group of individuals to the moon and return, by rocket. Quickly bringing the audience up to date, the next scene is a U. S. Army Corporal. As the Corporal roars off into the deep blue sky, one can hear murmurs of the audience, sighing and comfortably settling back for an imaginary flight to the moon.

To many people missiles mean space travel. In fact, the Soviet ICBM announcement referred to it as "the Road into the Cosmos." The prevailing public impression that missiles are somewhat extraordinary and have an affinity with space flight raises an interesting question: What are missiles?

Missiles are many things to many people.

To the anthropologist a missile is the perfect phallic symbol, the giver of life, the symbol of fertility. Ironically, our present military missiles are designed to destroy life. But in time we shall have the anti-ICBM, which will destroy missiles that would take away life. The antimissile missile is man's most promising defensive weapon. It, too, is a phallic symbol.

To the scientist, missiles are an extraordinary challenge. Highly complex and posing problems unique in applied physics, they beg exploration. Young scientists, particularly, seem to be fascinated by them.

To the economist and the budgeteer they are a nightmare. They are quadrupling the cost of weapons systems. The cost of missile hardware has soared far into outer space, so far as present budget ceilings go, and gives serious significance to the question: Can a nation afford (in an economic sense) to survive in the missile era?

To many airmen they are The Enemy, the device that threatens to put manned combat aircraft, and the men who fly them, out of the sky. Already, the attack has begun, and a few weeks ago one of the nation's top airmen opined that missiles would never replace pilots because they cannot think. This is a strange argument, since this is exactly the reason why they will replace pilots. Missiles do not have to think, and pilots must. But this kind of argument is all nonsense. Airplanes are here to stay and we have hardly begun to realize their full military and commercial potential as transports. All missiles must be flown and all fissionable material must be flown to the scene of combat employment. The stuff of atomic weapons is too sensitive to the hazards of storage and obsolescence, and too scarce in amounts related to requirements, to be handled otherwise. Finally, the combat use of missiles makes evident a new world of strategy and tactics in which the key is innovation, and success will be found in the time-honored talisman, mobility; this time air mobility. The missile is the airplane's friend, not its antagonist.

Missiles for the strategist and tactician

To the strategic planner missiles suggest an order of magnitude change in grand strategy. Air travel has shriveled the world in size while at the same time the tactical range requirements for surface-to-surface missiles have increased tremendously. The airplane has caused the former and atomic fission the latter. Nuclear warfare compels dispersion, and dispersion, in turn, demands great ranges of all weapons and instant responsiveness of all combat elements if man is to control the battle situation in which he finds himself. How can one reconcile the conflicting requirements of dispersion and control? Missiles and air mobility provide the answer. In combination with other forces, they portend a revolution in tactics and strategy.

Finally, missiles give the soldier independence of operations in his own media. The control of combat has been returned to the habitat of man—land. Armed with nuclear warheads, they give him complete control of the space over the land he occupies. They give him a tremendous surface-to-surface fire-power punch. And, finally, they offer him a very promising prospect of defense against missile attacks. Missiles are the soldier's best friend. He needs them to attack any military target that interferes with his attainment of his combat task. And in combat of the future, extended as it will be over millions of square miles, he needs missiles many hundreds of miles in range. If, for economic and industrial, or political reasons, they are denied him, he must assume that this is best for the country, and to every soldier what is good for the country is good for the Army. But missiles and nuclear warheads for use against strictly military targets are, in this age, the fighting soldier's greatest need.

British military policy gave striking evidence of its appreciation of the importance of missiles in the publication of its now famous White Paper. Explaining the reason behind the change in policy, the Paper states as follows:

> In recent years military technology has been making dramatic strides. New and ever more formidable weapons have been succeeding one another at increasing rate. In less than a decade, the atom bomb dropped at Hiroshima has been overtaken by the far more powerful hydrogen or megaton bomb. Parallel with this, the evolution of rocket weapons of all kinds, both offensive and defensive, has been proceeding apace.

Nuclear warheads and their delivery vehicles, missiles, have been "proceeding apace," and to this extent the Paper is accurate. However, it should have gone much farther. The most significant changes in nuclear weaponry are not, today, in the larger sizes. Quite the contrary, they are in the smaller sized and clean weapons. And this is of the utmost importance, for in order to provide weapons systems that will serve policy and in order that we may live in the atomic era, we must

develop smaller nuclear weapons. As recently expressed by Thomas E. Murray: "If we are to avoid the risk of slow defeat we now need a policy of emphasis on small nuclear weapons."

In passing, one should note the relationship established between missiles and nuclear warheads in this quotation. They go hand in hand, and missiles are as much a part of this age as nuclear weapons themselves.

Missiles for self-preservation

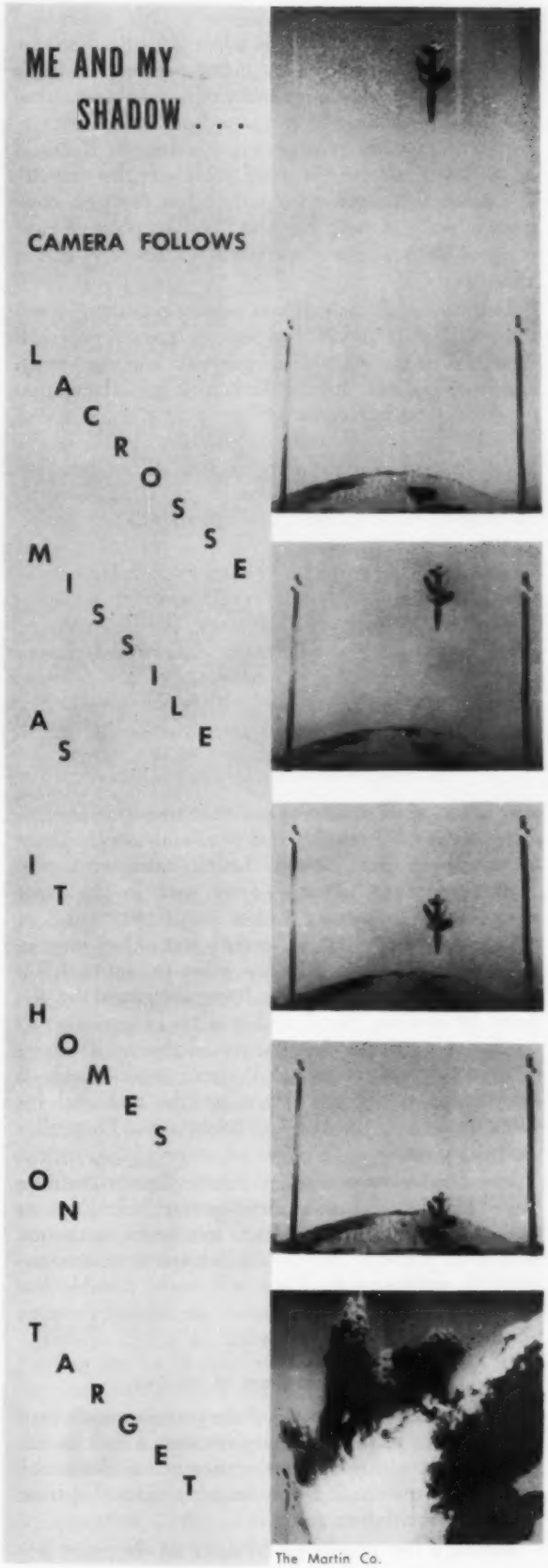
Self-preservation is the first concern of everyone. And self-preservation begins with an adequate defense against surprise attack from the sky. Nuclear weapons can provide that defense. Nuclear weapons are now so small and light in weight that they can be carried to very great altitudes very quickly by missiles and thus destroy not only single targets but multiple targets. And by targets I mean nuclear weapons in airplanes and in missiles.

There is much speculation these days about whether or not future war will be atomic. Will nuclear weapons, like gas, be banned by mutual agreement? Or are nuclear weapons replacing gunpowder and high explosives as an agency of destruction certain to be used by man in combat? In reply, there is room for much speculation except on one point. If a hostile aircraft or missile menaces our shores or our forces in the field, we should not wait until it drops an atomic bomb to decide whether to protect ourselves with high explosives or nuclear weapons. We should use nuclear weapons in air defense without question. This can be done with little hazard to those on the ground, and as a corollary to this, in passing, we appear to be entering a period when defense is enjoying a resurgence. Certainly against nuclear missiles, manned aircraft have little prospect of survival and an effective nuclear air defense is rapidly becoming our most impressive deterrent.

Missiles for land combat

Returning to combat on land, operations will extend over millions of square miles. The areas of responsibility of a division commander, for example, will have increased to about five to six times that of World II. A similar increase will take place in corps and army areas, and an army commander will need missiles of ranges on the order of about five hundred miles. Only missiles can provide him with the ranges that he needs to engage and destroy hostile military forces.

Missiles are far more efficient delivery vehicles of nuclear material than guns. Missiles experience accelerations of about 10 to 30g. Artillery projectiles require accelerations of about 10,000g. Obviously, the engineering and production problems in fabricating fissionable material in warheads are infinitely simpler in missiles than in artillery shells. In fact, squeezing uranium out of a gun tube is, conceivably, about the most expensive way of projecting fissionable material into a target area. Nuclear warheads need elbow room, they need space in which to expand if they are to function



The Martin Co.

efficiently. Gun tubes provide very little space, but there are no such restrictions when a warhead is associated with a missile. This means, getting down to hard facts, from a given quantity of fissionable material one has the choice of a given number of artillery rounds or a greater number of missile rounds. It should be evident from the foregoing, therefore, that missiles as nuclear vehicles are not only better from an engineering point of view, but also from the point of view of those of us who are interested in costs—and that is all of us.

Despite the discussion, now widely prevalent, about the need for small-yield nuclear weapons, until such time as they are available in quantity, and size, when and where needed, it is of the utmost importance that we develop weapons that will make an efficient use of available fissionable material. Materials should be developed to fill a specific need and they should be tailored to that need. We should not think of using thermonuclear weapons against small military forces, nor should we think of using very expensive long-range missiles when much shorter-range, more precise missiles will do the job. The requirement, therefore, is for a family of missiles adequate to the needs of the nation. When such missiles are available and deployed, we can rest assured of the adequacy of our defenses and any would-be aggressor will be assured of our capacity to deal with international avarice and greed.

The Army's first generation of missiles

It is for all of these reasons that the Army has so many operational missiles and is so enthusiastic about its missiles program. It now has an extensive family of first-generation missiles. They vary in size from seven inches to seventy inches in diameter, and in length from a few feet to seventy feet. They vary in range performance from a few miles to one of 1,500 miles. The latter, Jupiter, is being developed by the Army for the Air Force, and it is no exaggeration to say that it represents the most remarkable achievement in missile weaponry in the Western world. Each of the missiles is designed for a specific task and for operational employment by a specific unit. They fill a compelling need.

The surface-to-air nuclear missile family includes Nike Hercules, and under development Nike Zeus, as well as Talos and Hawk. Each missile has a unique mission to perform and they all complement one another in performance. They will make possible the achievement of a highly effective air-defense complex of any area we elect to defend.

Coming generations of missiles

Although a contemplation of the present missile situation is of more than ordinary interest, a look at the future is fascinating. All of the present missiles are of the first generation. It is the future missiles that have particular meaning to us.

Although few people would agree on the many implications of the missile era, most, I believe, would agree to the following. Missiles will provide an efficient means for exceptionally fast travel. Missiles will be developed for the movement of people and high-priority cargo at high speed about the planet. In war, missiles will be developed to move men and supplies. One can foresee, for example, the movement of raiding detachments deep into hostile territory by missile. They can be delivered accurately to a specific area such as, for example, the location of protected enemy nuclear stockpiles. They can be delivered with the means for their return, and after performing their assigned task they can return. Such excursions can include nuclear demolitions for use in exact areas for precise purposes.

When missiles drive manned combat aircraft from the skies, missiles will then have to perform many of the missions formerly undertaken by manned combat aircraft. This includes reconnaissance; for example, reconnaissance to obtain targets, weather information, radiological conditions and enemy dispositions. Missiles can and will be developed to perform all these tasks.

Missiles in outer space

Missiles will provide delivery means to place reconnaissance vehicles in outer space. Such orbital flight vehicles could conduct weather reconnaissance and could contribute to a much better understanding of the many phenomena of space that directly influence our Earth environment. The method developed to deliver an instrumented orbital vehicle for space reconnaissance is the first step in the development of a missile to launch a manned reconnaissance vehicle. Such a manned space vehicle could be very responsive to the needs of man on land. It could be selective and discriminating in its responses and remain in outer space for a considerable period of time. Finally, the inevitability of a conflict of interest between flight vehicles launched from different sources seems clear. The desire to control space will no doubt be a motivating factor in international relations in time, and the implications of orbital flight are both obvious and compelling.

From the ground to the ground

All missile operations discussed so far will start from the land, and the information sought and the individuals seeking it will be returned to land. Until man finds algae in the sky that will give him sustenance of life and fuel he must return to land. There appears to be a remote possibility of obtaining fuel from the atmosphere but none, of which I am aware, of obtaining sustenance for the human body. The control of land areas as missile bases, therefore, is of decisive national importance. And in the missiles era, the man who controls the land will command the space above.

Missile power varies inversely as its proximity to an enemy; that is, the closer one is, the more effective missile power is. The closer one is to an enemy the better the target information is. Cartographic information is far less reliable than the accuracy of missiles themselves, particularly in dealing with extremely long

Foxhole firing panel which monitors the Redstone missile during flight. The soldiers are members of the 40th Field Artillery Missile Group—the first Redstone-armed outfit

ranges, intercontinental ranges. There will be an enormous wastage of missiles until better cartographic information is available. In the meantime, shorter-range missiles will have far greater tactical and strategic usefulness. Next, missiles and their associated nuclear warheads will be very expensive indeed and an advantage will accrue to the user of accurate, shorter-range, less-expensive missiles. The reaction time in defense against missile attack will be very brief, and it may be anticipated that an attempt will be made to saturate existing defenses. This can best be done by many shorter-range missiles than a few long-range missiles. Long-range missiles provide a longer warning time and thus are easier to defend against. In summary, both ICBM and IRBM will be needed, very likely the latter in far greater numbers than the former.

Our frontiers are on the ground

In its conclusion, the British Defense White Paper, referred to earlier, makes the following observation:

> The possession of nuclear air power is not by itself a complete deterrent. The frontiers of the free world, particularly in Europe, must be firmly defended on the ground. For only in this way can it be made clear that aggression will be resisted.

The frontiers of the free world must indeed be firmly defended on the ground. For this is where freedom begins. It begins where men will stand and fight for it. It begins today along the 38th Parallel in Korea and the 17th Parallel in Indochina and at the Brandenburger Gate in Berlin. Freedom in a nuclear-missile era begins where man has available and ready to use—and has the heart and the training to use—missiles that will destroy any military aggressor. Such missiles should be responsive at once to the needs of a military commander. They should be used with discrimination swiftly and surely in the event of an aggression against military forces. By their very evident readiness to destroy enemy air or land aggression they will impress both our enemies and our friends alike. They will inspire confidence in our friends of the Western world and make evident to any enemy that aggression will not pay.

Finally, out of all the claims and counterclaims regarding nuclear-missile warfare that one hears these days, one thing stands out quite clearly: the control of land areas will be decisive in this period and through the control of land areas we will provide the reassuring confidence in its own survival that the Western world needs. And from the control of land areas we will be in a position, if the need arises, and I believe it most certainly will, to command space.

SQUADS IN ATOMIC

The training of the

COLONEL GEORGE W. DICKERSON

IN their billets, on training fields, and at social get-togethers, combat-scarred noncommissioned officers of World War II and Korea freely discuss the problems posed by war in the atomic age. The big question they ask is "How do we fight squads and platoons?"

As an infantry battalion commander for two years, as chief umpire on a recent series of battalion training tests, and currently as a regimental commander, I can attest that our forward-thinking small-unit leaders are apprehensive about the nature of their role in future warfare.

Our daily press and our troop information programs have educated the soldier on the military potential and employment of nuclear weapons. A soldier can barely escape the clichés and jargon used by present-day tacticians in their exposition of the principles of dispersal and mobility. Protective measures have been presented to a degree that the American fighting man accepts the new family of nuclear weapons philosophically, as our forefathers did gunpowder, the rifle, massed artillery, and aerial bombardment. It seems safe to say that our average trained soldier is aware of the possible destructive effects of these new weapons and of the necessity for battlefield mobility and it may be confusing the members of our smallest combat unit—the squad.

This appears to me to be the case for I have found that battlefield dispersal and mobility are of the greatest concern to rifle squad and platoon leaders. They realize that under the Pentomic organization squads will be increased to eleven men armed with light- and heavy-barreled rifles, improved grenade launchers, hand grenades, and antitank rocket launchers. They know that they may be transported to the fight in organic, lightly armored, cross-country, amphibian 8-ton vehicles. But the unresolved question that remains paramount in their minds is, what to do when they dismount and engage the enemy. Actually, most military futuristic planners agree that the small-unit battle will not be greatly changed. This needs clarification and re-emphasis. We can transport squads more rapidly from one fight to another in armored vehicles or by Army aircraft but what they do after they get there will depend upon what we train them to do now. It is our training that needs to be re-examined.

We can better understand this if we discuss training for

Colonel George W. Dickerson, *Infantry,* was commissioned from VPI in 1941 and served in the Second World War with the 24th Division, whose 34th Infantry he now commands. This is his fourth contribution to this magazine and its predecessors.

Illustrated by Lieutenant Colonel

LACHLAN M. FIELD

BATTLE

Pentomic Squad

defense rather than attack. During an attack, commanders at all levels are generally satisfied if they know immediate and possible objectives, additional support they will receive, and the scheme of maneuver. But when he is defending, your platoon or squad leader must know much more. What is the overall mission? Is this the final showdown or a delay, and for how long? Must the position be held at all costs, even to annihilation? What part of the force must be sacrificed if necessary? If forced to withdraw, where is the next battle line to be established?

Only by knowing these things can the leader intelligently plan the extent of his defensive works, the amount of ammunition and supplies he will attempt to dump on position, routes of withdrawal, subsequent positions of reserves he might expect to be committed in his sector, the fires that can be massed in his support, and so on. Maximum performance cannot be expected of a unit, no matter how strong its position or how determined its members, unless they understand the general situation, particularly the purpose and probable duration of the defense. The importance of this will be even more pronounced in the future. Squad leaders must be constantly informed, and they, in turn, must get the word down to their men in brief, simple terms.

The tactics of the squad in defense appears to be the most widely misunderstood phase of training pointed toward the future. Defense has never been popular with American troops, for in itself, defense implies desperation. With rare exceptions, victories have not been won by defensive battles. Yet defensive tasks would face us both in Europe and in the Far East, if hostilities were to commence. Our defense must be good enough to allow time for the arrival of reserves to bolster subsequent offensive actions.

The squad in defense

The over-all mission of the rifle squad on the atomic battlefield remains much the same as in the past, with few modifications to keep step with the faster tempo imposed by swifter means of transportation and greater destructive forces. The fires of rifle squads, supported by those of other units, must stop the enemy forward of the battle area and repulse his assault in close combat if the need arises. To protect the flanks and rear of the platoon area the squad must be ready to move rapidly to secondary positions. It must also be trained and prepared for independent missions like establishing and guarding roadblocks, or patrolling.

In employing his unit as part of a rifle platoon in the defense of the platoon's battle area, the squad leader coordinates the actions of his own with adjacent squads and

supporting weapons. In his defense order he assigns individual positions, specifies individual sectors of fire, and specifies the exact location and principal direction of fire of automatic rifles (if not already assigned by the platoon leader).

The width of the area occupied by the squad is influenced by the terrain and the ability of the leader to control each individual soldier. Actual frontage should not exceed 100 yards unless additional weapons are assigned to the squad's sector. In areas of dense growth, frontages should be less than 100 yards. Since the primary factor here is control, the squad leader spreads his men no farther than is possible for effective control. He keeps them close enough in to allow visual and oral contact with each man whenever possible. In battles of the future the rapid relay of commands with a corresponding speedy response at small-unit level is essential in order to provide flexibility and mobility. This is basic to our atomic age Army. In order to "disappear" by using armored personnel carriers and then regroup rapidly for the mission and disperse again, and to keep moving ever faster, the word must get down to every last man, almost instantaneously.

Without attempting to discuss the complete subject of squad defense, let's cover only those phases in which most of our deficiencies continually seem to recur: communications, deployment, fire control, and battlefield illumination.

Revival of arm-and-hand signals

Our Army is blessed with the world's most advanced and elaborate signal communication equipment, from commanding general down to platoon leader. But from here down to the front-line rifleman we depend on antiquated means: oral commands and arm-and-hand signals. Herein lies one of our greatest weaknesses, for too few soldiers know or practice arm-and-hand signals. For the battlefield of the future, where speed in relaying commands is vital, these old methods must be reexamined, and, when sound, given a boost in our current training.

We rely too much on wire and radio. The helmet radio, even if produced in sufficient quantity to supply a mobilized army, will still not replace the old and reliable ways of controlling riflemen within squads. The chain of command down to the individual soldier is the vital artery of the control system, the means through which higher commands extend authority and control. Interrupt it anywhere along the line and the normal command flow—the only thing that insures effective execution of the commander's plan—is cut or diverted.

To survive in battle, platoon leaders must station themselves during action so as to be able to transmit orders to squad leaders. By the same token, squad leaders must be in visual contact with all members of their squads; to give orders, to supervise individual actions, and to see that men carry out the plan. All men of the squad must be trained to look to the squad leader or his assistant for orders.

Too often platoon leaders unnecessarily expose themselves when issuing fire orders to squad leaders. Likewise, because of inadequate and unfamiliar signals, too frequently squad leaders leave protective cover in trying to control their men. The answer is to get back to the practical problem of realistic communication methods within squads and platoons. First, by continuous practice in arm-and-hand signals, as well as oral commands. Next, through a system of prearranged signals within squads and platoons. Strings, cord, vines or wires between foxholes, with a system of tugs, can be effective. The old method of tapping on butts of rifles is still good, provided everyone remembers the signals.

Squad deployment

The problems of communication and control within the squad are very closely related, and depend upon the proper deployment of the squad. The battlefield dispersal of atomic tacticians has been oversold at the small-unit level. Too frequently the consensus among squad leaders indicates that greater battlefield dispersal in atomic warfare seems to call for greater distances between individual men in attempting to cover a larger area. The opposite procedure would probably pay larger dividends. We would gain a great deal in communication and control, teamwork, and speedy movement, if squads were held intact, deployed in horseshoe formations with individuals in two-man foxholes and with greater distances between squads.

As an example assume an eleven-man squad, using two-man foxholes, where the squad leader has to control only five two-man firing positions against the problem of attempting to communicate with ten widely dispersed individuals.

The average American is gregarious, and not at his best when playing a lone-handed or tactically isolated part in battle. He is not a Kamikaze or a one-man bangalore torpedo. Consequently, the best tactical results are achieved by dispositions and methods which link the firepower of one man to that of another. Distances between squads, night and day, can be effectively covered by hand and rifle grenades, booby traps, tactical wire, rifle fire, and the like. Even in hand-to-hand combat, two are better than one. The psychological effect of the team, the buddy foxhole system, and the stabilizing influence of the squad leader's voice and physical presence far outweigh the benefits gained through greater dispersal between individual men.

Fire control and discipline

Communications, hand signals and oral commands, deployment, and two-man foxholes, if properly organized within the squad, further complement fire control so essential to a successful defense. In fact, they are vital to effective fire control at squad level. Poor fire control and fire discipline can unhinge an otherwise well-prepared defense. This is a recurring deficiency at small-unit level. One of the great advantages in combat is surprise. An attacker usually has only a vague idea of defense dispositions, particularly when dummy and alternate positions have been

prepared. He strives to learn their exact positions so that he can soften them up with mortar and conventional and nuclear artillery fires. Premature and indiscriminate firing by the defenders plays right into his hands. The disciplined unit that can wait in concealment until it can see "the white of their eyes" and then cut loose with a withering blast will always beat back at least the first several attacks. This is particularly true in blocking a defile or in an ambush, where one indiscriminate shot may reverse the entire outcome of the action. Moreover, poor fire control and discipline can result in that greatest of all battlefield disasters—running out of ammunition. With the terrific increase in rates of fire of our new personal weapons, the ammunition problem becomes even more acute at the squad level. Effective communications and control within the squad are essential to its fire discipline. Practice your signals.

Using your eyes at night

Illumination is essential to an effective defense at night. But all too often we omit it in small-unit training exercises. We all know that illumination can be provided by artillery and mortar shells, trip flares, grenades, by Army aircraft drop, and even by searchlights. Determined night attacks can rarely be repulsed without the aid of illumination. The essential thing is that illumination must expose the enemy without revealing or silhouetting ourselves.

The squad leader must train himself to be habitually alert to use the illuminating devices available to him on an on-call basis. He must know how to call for them, how to recommend their use, and be willing to check his platoon leader to insure that this support has not been overlooked.

Within his own squad team he should have, readily available, illuminating hand and rifle grenades and trip flares. The M1 hand grenade with fuze illumination generates a light of 80,000 candlepower for twenty-five seconds, and it can also be fired from the grenade launcher of the M1 or carbine, as well as the new M14 rifle. The M48 parachute trip flare ignites 200 to 250 feet in the air and lights up an area of 300 to 400 yards. The M49 stationary trip flare ignites on the ground and likewise covers an area of approximately 400 yards. Another device usually available and very effective is the M118 illuminating booby-trap simulator, which emits a flame for about thirty seconds. On a fixed-position defense, thought must be given to the use of the airport flare armed to ignite from a rip cord. It burns for three to five minutes and lights up a much larger killing zone. Improvised "foo gas" illuminators are also effective. There is a wealth of training literature on their preparation and use. The importance of trip flares in small-unit defensive action to illuminate the area to the front as well as that between strongpoints must be continually stressed in training. Their use must become ingrained in the squad's thinking, and geared into all exercises involving night defense.

Rifle grenade launchers

The rifle-grenade launcher is another weapon available to the squad for covering defilade and other areas not effectively denied the enemy by small-arms and machine-gun fire. The newest model gives the squad greater antipersonnel lethality than can be attained by 60mm mortar fires, and its lightweight ammunition gives this weapon range and accuracy for area coverage in between those of the hand grenade and the 81mm mortar. Until the new launcher has been widely distributed, the current rifle grenade must be more thoroughly integrated into small-unit fire plans. On dry-run exercises, they should be affixed to weapons and plans made for their simulated use. On live problems failure of small-unit leaders to supplement their fires with these effective weapons should be considered a cardinal offense. We must constantly train our squads in the use of this lethal adjunct to our rifles.

Finally, let us consider the Big Bang weapon and how our squad should meet it.

Meeting the nuclear attack

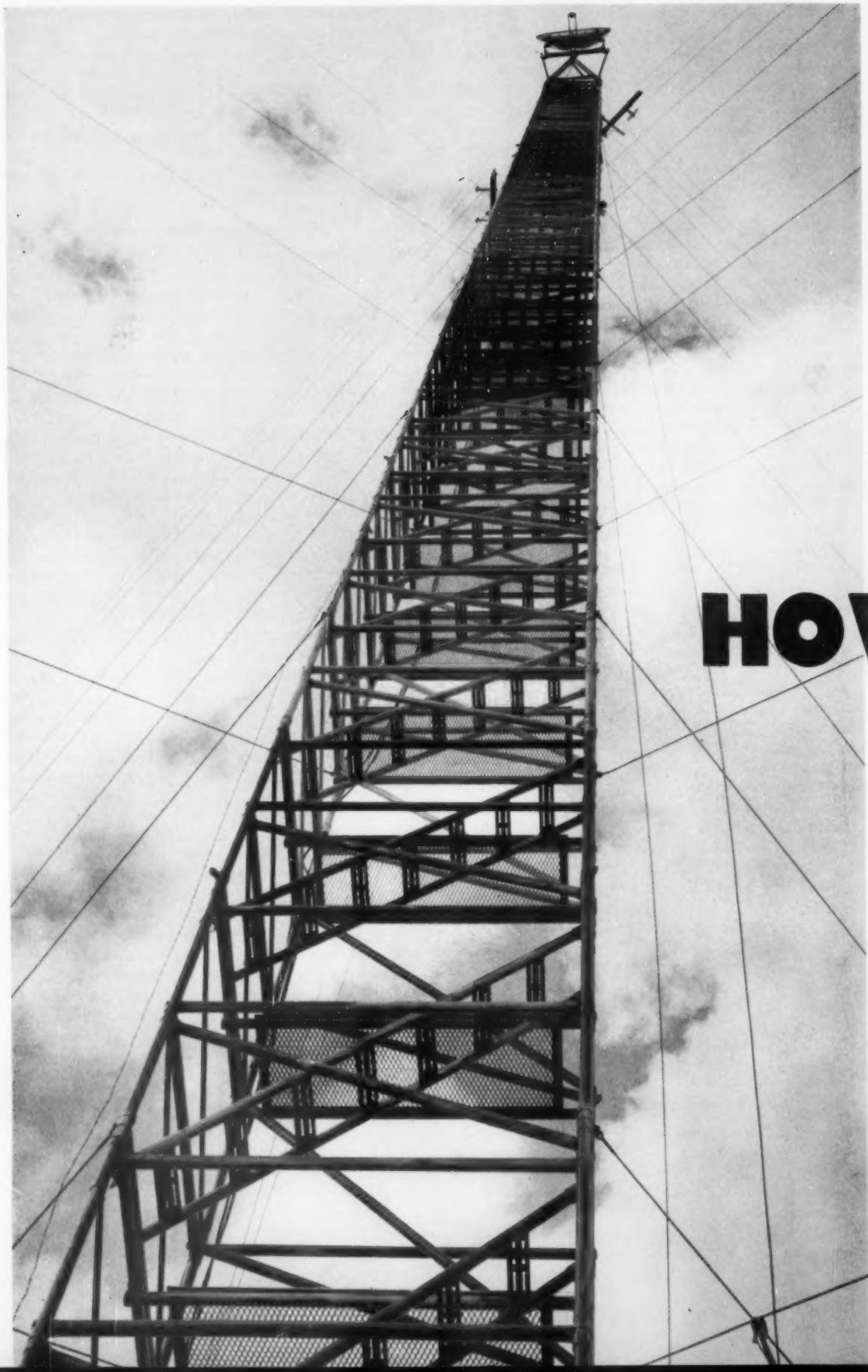
Nuclear weapons have aided materially in strengthening the over-all defense. Nuclear weapons organic to our larger units can easily crush an enemy assault. Conversely, his use of them against our defenses will be disastrous unless we are organized to meet such an attack. Our new organization and transportation means provide some over-all protection within themselves. However, these new concepts place added responsibilities upon small-unit leaders during combat.

Shelters for personnel, weapons, rations and technical equipment must be ready for instant use in order to lessen or neutralize the principal injurious effects of an atomic explosion. Foxholes and trenches and other emplacements must have shelters built into their walls with overhead cover of two or three feet of good soil. Rations, water, ammunition, radios and other equipment should be stored in these shelters; when time permits the span should be enlarged to accommodate individual men and weapons crews. In order to deceive the enemy, camouflage must be undetectable so as not to present a suitable target. Skylining of troops must be prohibited.

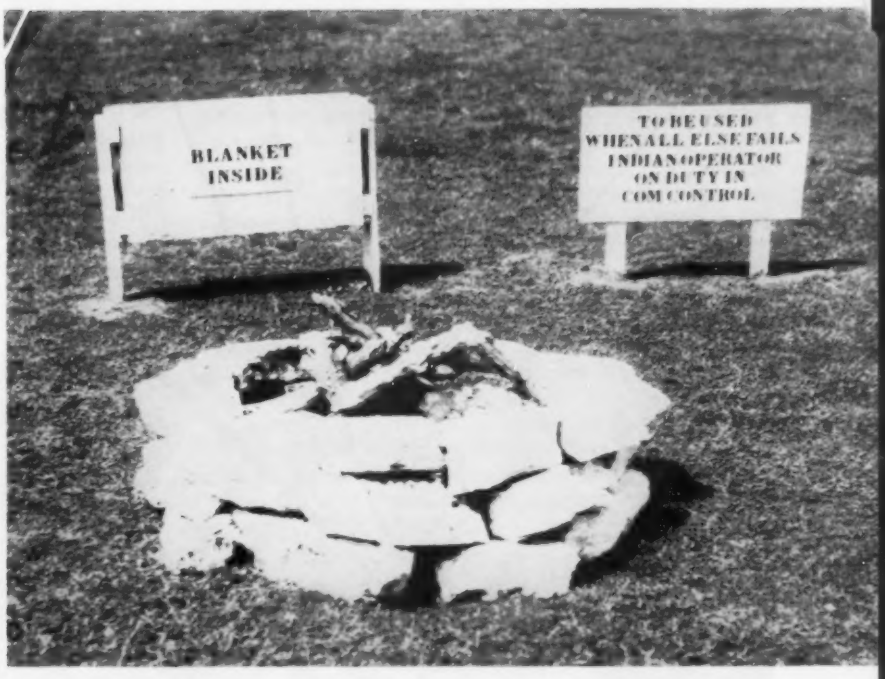
As with any explosion, the more material or distance between you and the blast, the safer you are. If you are caught in the open, falling flat on the ground and covering your face is better than standing. A foxhole with one-half foot of earth for cover will reduce residual radiation to one three-hundredth of that received in the open. However, a soldier in a foxhole must be well below its lip to benefit from the shielding effect. All units of platoon size and larger are equipped with the tactical dosimeter that registers total radiation. The greatest potential danger from fallout can be avoided by protecting personnel during the early hours following its arrival.

When warning is received or instruments indicate the presence of fallout, all men must immediately jump into foxholes and cover themselves with ponchos, shelter halves, or other cover. This does not reduce radiation, but it prevents radioactive particles from entering the emplacement, and the improvised cover can be thrown aside when fallout dissipates. Troops should be trained so that after fallout has subsided, they deepen their foxholes and throw the spoil around the outskirts of parapets before crawling out. Also they must brush away from their clothing dirt or anything else that falls into the holes.

The possibility of the sudden outbreak of war poses a continuing and disquieting threat. We soldiers are entrusted with guarding our nation against aggression and we must be ready. It is essential that we reexamine the basic fundamentals of good tactical training in the classroom and in the field. The challenge of the missile-atomic age is as great to the small-unit leader as it is to the commanders of divisions, corps and armies.


HOW

The long legs of 204-foot microwave towers *(left)* at Exercise King Cole helped blanket some 13,000 square miles of the Louisiana maneuver area with communications. The microwave equipment provided as many as forty-five telephone channels down the center axis of the network and when all possible combinations of cable and radio-relay were added the total number of channels available was ninety-three. That old standby, the Crazy Horse system *(right)*, was unused since all else didn't fail.



THEY DID TALK AT KING COLE

COLONEL ERLING J. FOSS

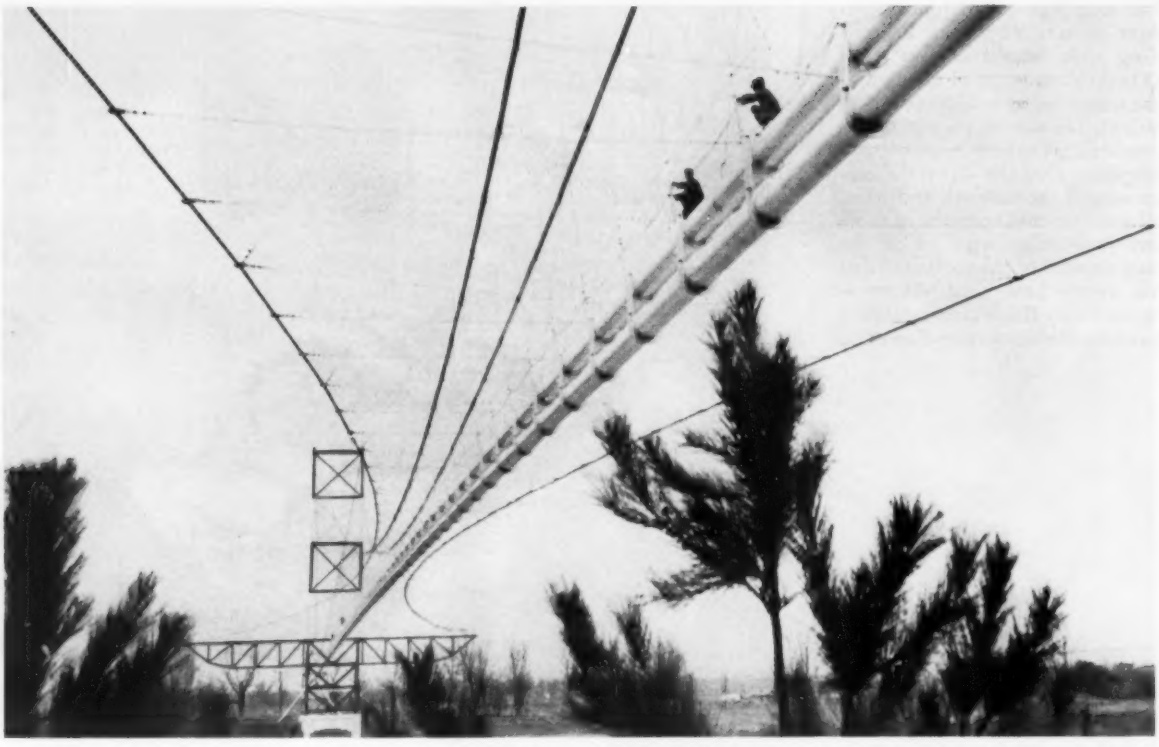
"NUMBER please?" describes the control communications system that operated during Exercise KING COLE. The maneuver was controlled by conversation, and the telephone proved the most extensively used communications device. Many other electronic methods were available, plus message service by helicopter and jeep and even, as a last resort, a station where Indian smoke signals could be sent. This latter *(see cut above)* was established by communications crews in a moment of levity.

The communications system at KING COLE was considered by some to be revolutionary, since it accomplished its intended purpose. That is, it worked.

Actually, there was nothing revolutionary about this communications network. Only proven and sound practices were employed, but no doubt they differed from those used on past maneuvers.

KING COLE was a command post and field training exercise conducted in the Louisiana Maneuver Area from 27 March to 16 April of this year. Lieutenant General John H. Collier, Commanding General, Fourth U. S. Army, was maneuver director; Headquarters III Corps was maneuver headquarters. Other major units participating were XVIII Airborne Corps, 1st Armored

Colonel Erling J. Foss, Signal Corps, is a 1941 ROTC graduate of the University of Minnesota, and was integrated into the Regular Army in 1946. During World War II he served as Signal Officer, 5th Armored Division. He was Signal Officer at Exercise King Cole and is now Chief of Staff, USA Signal Training Center, Fort Gordon, Georgia.



Crawling along the catwalk atop pipelines spanning the Red River near Natchitoches, Louisiana, two members of the 41st Signal Battalion string a spiral four (telephone) cable that provided part of maneuver communications

Division, 1st and 3d Infantry Divisions, 82d and 101st Airborne Divisions, 2d Armored Cavalry Regiment, and 2d Logistical Command.

In general, the exercise provided tactical training for commanders and staffs and realistic field training for special weapons, antiaircraft, and other participating units, and conducted certain troop tests. The troop tests were concerned with the tactical support center, intelligence doctrine and military intelligence support, special demolitions, and a new concept for Army Ordnance guided-missile and special-weapons supply.

This was a free maneuver, units moving at their own discretion according to the tactical situation. It was also a one-sided affair, and the umpires (referred to as controllers) injected enemy actions into the maneuver play. Their actions were in turn coordinated by exercise headquarters.

Microwave towers and suspended cables symbolized the control signal communications system employed by exercise headquarters, which operated from North Fort Polk for control and coordination. It also served administrative and logistical communications needs in addition to augmenting the tactical long lines.

An average of 13,000 telephone calls originated or terminated at KING COLE headquarters daily. The teleprinter was not used extensively, since only 200 to 300 messages were passed each day, totalling less than one million groups for the entire exercise.

It was unusual that a headquarters staff could use the telephone as the primary means of controlling a free maneuver extending over an area of approximately 13,000 square miles. Telephone has long been acknowledged as the means to obtain personal contact, but for reports the written message is still considered better, since it automatically becomes a matter of record. Yet, during this exercise, the telephone was used, and trunks were tied up while lengthy verbal reports were being made, denying use of those trunks for valid calls.

Discipline and education in the use of communications can do much to improve service. But the demand for phones indicates that service speedier than that afforded by our present teleprinter system is desired and necessary. It is well known that the teleprinter can handle traffic rapidly (the electronic signal travels with the speed of light), but unfortunately our methods for transmitting messages by teletype are not so speedy.

TWX troubles

Use of the teleprinter everywhere in the Army is rigidly controlled, and only certain people are permitted to send teletypewriter messages (TWX). These messages must pass through the AG or staff message control. Furthermore, all TWX are sent in the name of the commander and prepared on Joint Message Form DD 173, and must be concise. Abbreviations listed in SR 320-50-1 and JANAP 169 are generally used. This is well and good, since it makes the message brief, to the point, and reduces transmission time. However, transmission time is not the problem, for Change 3 to AR 105-31 states that normally abbreviations will not be used in electrically transmitted messages.

Few officers can prepare a message in the approved manner without the aid of a secretary or chief clerk specially schooled in the proper make-up. By the time the message

is reduced to its terse and abbreviated form, it appears "enciphered" but still is not ready for transmission. It must be properly coordinated and sent to the AG or staff message control for release. These delays are repeated at the receiving end.

Another mystery must be cleared before the message can be sent: What staff section or command gets the message for action? If the message is such that the action staff can readily be determined, the whole thing is a cinch. Now all we need do is "decipher" the message and transpose it into what passes for the King's English. Actual cryptography is not meant here since that is intended to confound the enemy. I merely show how we confound ourselves.

The use of the telephone is not so strongly controlled, nor does a call constitute an official message in the name of the commander, although it may cause official action. Normally, the phone is controlled only to reduce costs by limiting calls over the commercial long-distance system. The need for a call over an operational military system has rarely been questioned, and unless there is flagrant misuse it shouldn't be.

One of the 204-foot microwave towers that dominated the Louisiana maneuver area reaches skyward behind two pole-climbers from the 53d Signal Battalion

During KING COLE two thirds of all calls were over the long-distance trunks which extended 100 to 200 miles into the maneuver area. Since all this unofficial use went on and relatively few official messages were passed during the exercise—and the maneuver was conducted successfully—the need for all the formality in electrically transmitted messages is certainly open to question. This suggests that our teleprinter system should be looked upon as the Army's Western Union, allowing the recipient of a message to be addressed directly, with the originator as signer. Messages so transmitted would not be official—unless actually sent in the name of the commander—any more than a telephone conversation is now. The need for sending such messages through the AG would be eliminated also. Surely this is worth full consideration.

If our Army is to function properly under the concepts of atomic warfare, with dispersed distances and fluid movements, we must have less centralized control and the individual must be fully responsible for what he does.

But getting back to KING COLE, all long-distance trunk patching was on a four-wire basis. This may not mean much to the layman, but he can appreciate it since it provides the same high-quality telephone service in the field that commercial lines offer. If we are to have quality circuits, our future tactical phone systems must be designed around the four-wire principle.

You go to the phone

A basic principle of the KING COLE communications system was that the subscriber came to the communications rather than the system going to the subscriber. That may sound somewhat ambiguous, but what it does is shift the responsibility for using the signal system to the subscriber rather than making the signalman responsible for following the subscriber and providing him with service at every conceivable point. For example, if you are out driving in the country some sunny afternoon and suddenly remember that you have forgotten a message you must pass along, the first thing you do is look for a telephone. Since the commercial telephone systems do not have wire crews tagging after people to give them immediate service, you must stop at a phone booth. If you have a radiotelephone in your car, things are very convenient indeed, provided your are within range of a radiotelephone terminal. So it went during this exercise.

Throughout the exercise area there were twenty-four communications centers electronically connected to one another by radio-relay and cable. Each communications center had telephone and teleprinter circuits direct to exercise headquarters. In addition, all centers were interconnected by telephone and teleprinter. The system was mainly a fixed one, and radio circuits were not duplicated by wire. Instead, a combination of radio and cable was used. The important circuits were divided between radio and cable so that if one part of the system failed, signals of primary importance could still be passed on. All cable was suspended from poles and installed in accordance with a standing operating procedure peculiar to the system. One

thousand miles of cable using 155 unattended repeaters and operating on a 12-channel telephone carrier principle were suspended from over 20,000 poles. Microwave radio and multiplexers on the center axis provided 45 telephone channels. From the center axis to the laterally established centers 12-channel radio-relay was employed. Combinations of cable and radio-relay provided as many as 93 telephone channels down the center axis.

As we have seen, the exercise area covered approximately 13,000 square miles and the tactical troops maneuvered over this area, as did the controllers. Exercise headquarters desired contact with the controllers at all times and injected problems into the exercise situation through the controllers at corps, division and regimental levels. Each of the twenty-four communications centers had an AN/FRC-27 radio covering a 20-mile radius.

All controllers were provided with the vehicular-mounted AN/VRC-19. This mobile radio gave the controllers direct contact with the nearest control center. A message could be passed for relay, or a telephone patch could be made by radiotelephone integration, to any point in the signal system. The telephone patch was used extensively and perhaps excessively because phone conversations tend to become lengthy. While the mobile radiotelephone functioned well, the radio did drift off frequency because of humidity and temperature changes, thus reducing the effective range of operation and making necessary frequent alignment of the radio.

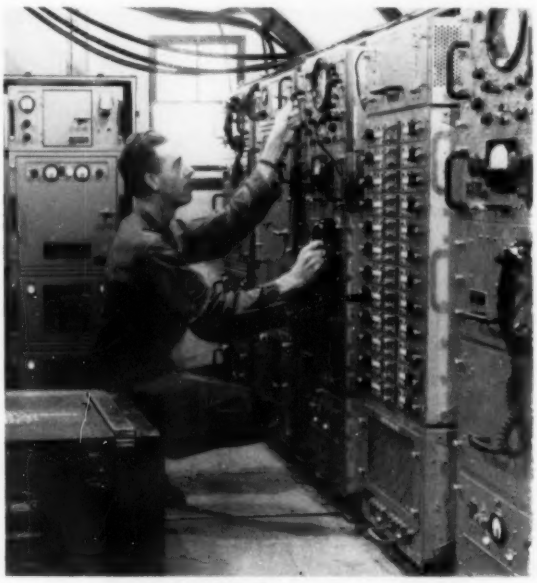
Tactical communications tied in

Telephone and teletype communications with corps headquarters, five division headquarters and an armored cavalry regiment were established through radio-relay connections to the nearest control communications center. These connections were primarily for control use, but at times they augmented the corps tactical system. Spiral-4 cable was also used to make connections when prevailing conditions permitted. Corps headquarters was connected to the major network by three 12-channel systems that furnished thirty-six telephone channels. Division headquarters and the regiment were connected into the major network with 4-channel radio-relay equipment.

The AN/GRC-26 radio was used for voice transmissions among corps and division controllers and among those of corps artillery, artillery groups and special-weapons battalions. Division-to-regiment voice radio nets for control purposes were operated with the modified AN/GRC-19 (not to be confused with the AN/VRC-19). Although this set is comparatively simple to operate, it is not so simple that it works efficiently without carefully selected and trained operators. A certain amount of common sense is required to operate a radio, as with many other things, and when this small spark of intelligence is lacking it results in inefficient operation.

A high-frequency radio broadcast to give general information to all controllers blanketed the entire maneuver area and operated with considerable success. Broadcasting stations were located at Ruston, Natchitoches, and North Fort Polk. Each operated on a separate frequency, but all three transmitters were keyed simultaneously by a single microphone at the studio at North Fort Polk. Hourly broadcasts were made during the entire period of the exercise. This system was particularly successful for reaching controllers, and instructing them to call into headquarters for various reasons.

Mail is communications, too, and the ubiquitous helicopter was used to deliver it to isolated units



Master Sergeant John Hyder at the panel of the microwave equipment installed in a Jamesway-type shelter

A teletype broadcast system was installed for the headquarters staff. Each staff section had a teletype which was used for receiving only electrically transmitted messages. All incoming messages came on teletype tape and were then transmitted simultaneously, with staff responsibility indicated, to all sections. The action staff was determined by the AG, whose staff distribution office was in the communications center. In this way, action and information copies

were received by all sections immediately. Outgoing messages were also distributed by this means to serve as information copies for all staff sections, but only after the messages had been hand-carried to the communications center and transmitted to the addressee.

Closed-circuit TV

Within the North Fort Polk headquarters area a closed-circuit television system was installed and used primarily for presenting periodic operational briefings to the exercise headquarters staff. Three cameras and seventeen receivers were employed, for the headquarters was widely dispersed throughout the post. Television proved very popular with the staff, and got a high Hooper rating. Although black-and-white TV was excellent, color would have been better for map displays. Classified information was not projected, but on an approved circuit basis there is no reason why this could not be done. There are great possibilities for the use of TV, and considerable room for improvement by using screen projectors and kinescope recording.

A dependable means of communication, though less spectacular, was messenger service. A combination of air and motor service provided complete coverage of the exercise area every four hours. Like the postal service, deliveries were made in all kinds of weather. The helicopter—principally the H-19—was used extensively, and only the foulest of foul weather could ground these aircraft.

The exercise's signal section was organized to function at the general staff level for the maneuver and the signal officer reported directly to the chief of staff. This set-up was important, for the efficient control and operation of the communications system would have been hindered had a set-up subordinating the signal officer to a general staff section been adopted. The signal officer had operational control of the network. More than 190 officers and 3,200 men were directly involved in operating the communications system.

Perhaps at this point one visualizes the considerable advance planning and engineering that preceded the actual installation of equipment, and then only after the materials had been procured and delivered, as well as the great amount of installation work that preceded the operation. Although the exercise began in late March, signal units from all parts of CONUS assembled in Louisiana during the first weeks of January. Signal planning had begun the preceding June.

During the operational phase torrential rain, high winds and electrical storms were encountered. They were so frequent and so violent that it seemed amazing that communications functioned without interruption. But it was gratifying to know that all the prior hard work had not been in vain. Commercial and stand-by emergency generators produced electric power for signal centers. The frequent interruptions of commercial power during electrical storms caused equally frequent use of emergency generators. All centers were pre-wired in such a way that switching to emergency power was quick and safe. For this purpose more than $14,000 was spent for power switches and distribution panels to keep the multimillion-dollar network from going dead.

The excellent signal-to-noise ratio obtained on all radio-relay systems proved meritorious, especially during the storms. Heavy downpours affected UHF signals, and had not good-quality circuits been operating initially, system failures might have been experienced. Ultra-high-frequency (microwave) radio-relay systems were in use for 7,920 hours and operated 99.2 per cent of the time. Very-high-frequency radio-relay systems were in use for 16,896 hours and operated 99.5 per cent of the time. Power failure was a primary cause of what interruptions occurred. Of all systems used during electrical disturbances and rainstorms, the suspended spiral-4 cable proved most dependable and produced the best signal. The merit of proper cable installation was proved under these conditions. Some of the more outstanding interruptions were caused by hunters shooting at birds perched on the cable. Also, civilian-driven cars appeared to have a great affinity for telephone poles, which did not help to keep the cable fully operational. The 12-channel carrier cable systems were in use for 32,928 hours and operated 98.7 per cent of the time.

The importance of engineering

The importance of engineering a communications system to the operational control method used in the maneuver cannot be overemphasized. This is axiomatic and is peculiar not only to maneuver communications but is related to all types of military operations. It is imperative that the signal officer know every impending operational action in sufficient time to be ready for it from the communications point of view. Since good communications means good operational control, G3 and signal must work hand-and-glove. KING COLE revealed time and again that many officers have a very poor knowledge of the capabilities and limitations of their communications. An officer who does not appreciate communications is not ready to command a tactical unit. Communications are as important in his education as training in tactics and fire and movement, because without them you cannot effectively control either weapons or movements. Yet in our Army we do not seem to place sufficient emphasis upon communications until we take to the field. Suddenly, the requirement is there but the knowledge is lacking. The usual outcome seems to be numberless complaints and proposals for remedy. After the maneuver, and in the relative comforts of garrison life, things other than field communications become of greater interest and the experiences of the maneuver are forgotten. We must overcome this attitude and place greater emphasis upon operational field communications.

Conjecture—widely used in a CPX—cannot be applied to operational communications. Either they work or they don't. They must always be tested because they cannot be simulated.

The signal communications system used in Exercise KING COLE was engineered to fit the method of operational control required by the headquarters command and staff.

Radio broadcasts, teleprinter and television were innovations that proved practical, as was the integration of mobile radio with the telephone system. While the phone system was saturated and could not handle any more calls than it did, only partial use was made of other communications means.

More efficient use of available facilities could have been made had the capabilities and limitations of communications been better understood by more people.

KING COLE proved to be wonderful training in communications matters for all concerned. Without doubt the benefits achieved will improve the operating efficiency of Futurarmy.

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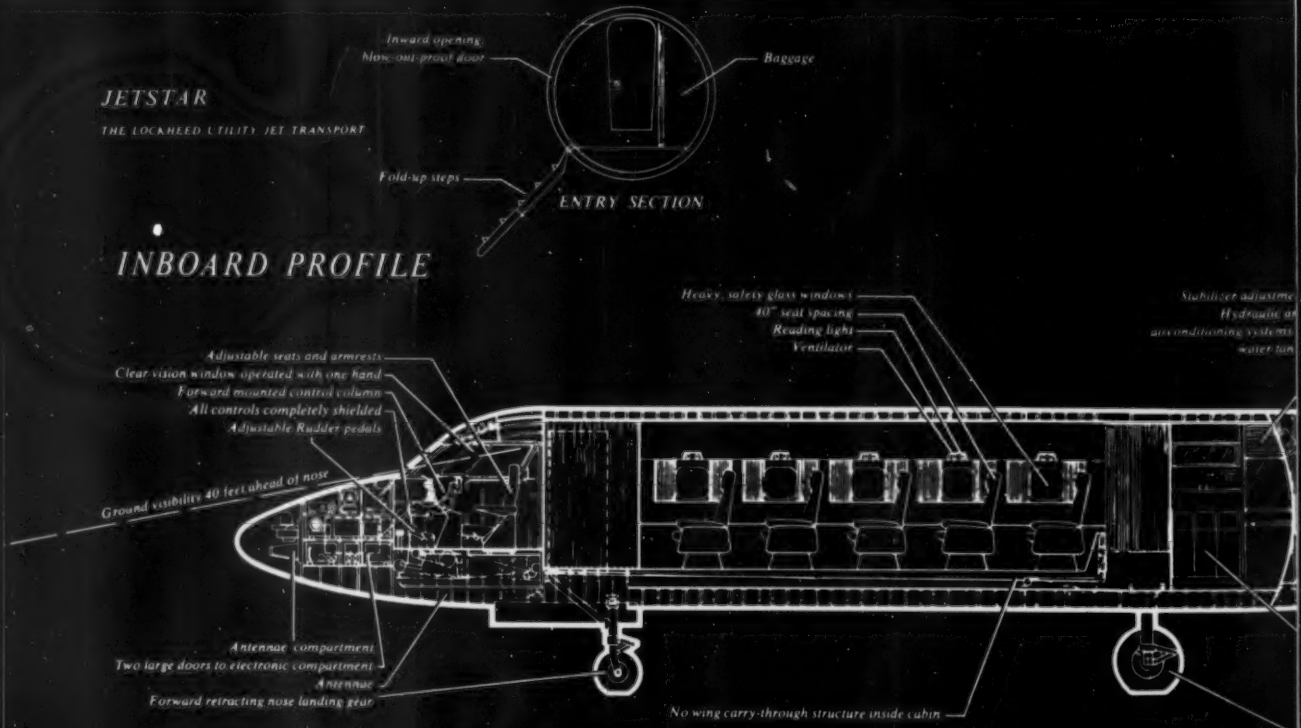

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THE ONLY WARS WE CAN AFFORD

are those that give us a choice of strategies

RAYMOND L. GARTHOFF

AMERICAN military strategy is approaching a critical crossroads, a challenge to its basic doctrine. The strategy of destruction on which we have relied has become so effective in terms of potential global destruction, that paradoxically it is becoming ineffective as an instrument of national policy. Exclusive reliance upon this strategy is depriving us of the capabilities for effectively pursuing alternative strategies which may under various circumstances be urgently required by national objectives.

"Strategy" is employed both in military and in political analysis and planning. Insofar as this dual usage helps draw attention to the necessary connection between the political and military components of strategy, it is desirable. But the effect of using the term in political analysis has adversely affected our understanding. Strategy is usually identified with "ends," in contradistinction to the equating of tactics with "means." While the distinction may sometimes be valuable, it also may obscure the basic nature of strategy, which is itself a means to attaining an objective. It is a means of a higher order of generality, in scope and duration, than a "tactical"

Raymond L. Garthoff, a specialist on Soviet military and political affairs, recently completed a tour at The Rand Corporation where he had been a member of the staff since 1950. He has lectured on various aspects of Soviet military affairs at the National War College, the Army War College, the American Military Institute, and elsewhere. He travelled in Europe during the past summer. He received his doctorate at Yale. Dr. Garthoff is the author of *Soviet Military Doctrine* (reviewed in our February 1954 issue) and has contributed several articles to *ARMY*.

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measure, but it is not itself a goal or ultimate objective. Consequently we must identify the basic objectives of policy in pursuit of which our strategy is designed. Clausewitz's dictum, "War is the continuation of politics by other means," while often quoted, is too rarely reflected upon.

Political strategy and military strategy both further the basic objectives of national policy. They are complementary, coexisting with each other. This is a truism we forgot in two world wars, when we subordinated our best interests and true aims to the proximate goal of complete military victory.

"Military strategy" is the science and art of conducting war as a whole (in contrast to tactics as the science and art of fighting individual engagements or phases of war). But a military strategy is a plan, or at least it should be a plan, to achieve particular objectives in prevailing or anticipated specific circumstances. Naturally, an alternative plan must be at hand to meet a conceivable contingency. Plans are changed, or discarded and superseded, by new ones, as key political, technological, or other circumstances are modified. We must also distinguish between military strategy and military doctrine. Military doctrine is the codified consensus on methods of conducting military operations, a guide for employing forces in combat. Thus, while strategy relates to the attainment of objectives, doctrine relates to the employment of means.

Strategy encompasses four key elements: the objective; the strategy proper, or plan of operations to attain the objective; the capabilities and forces available for commitment; and the doctrine governing the employment of committed forces. As we have observed, military strategy is a plan—but plans are not always rationally provided, and our strategy may be fashioned by default rather than by design. Thus, military capabilities and force allocations may be determined by some extraneous element rather than by the requirements of strategy pursuing definite objectives. For example, political and budgetary considerations may limit the resources available for military purposes. In addition, if military force-level planners are subject to or subjected to prejudgments on the type of war we will wage (that is, a commitment on future objectives of strategy), the budgetary pressure may limit our forces to those for the prejudged strategies, and to inadequate attention to other possible necessary strategies. Flexibility in future selections of appropriate strategies may thus be severely curtailed. It is clear that strategic concepts must be based on anticipated probabilities. Flexibility, in this sense, must always be limited, but limited in the ways least constraining on strategic initiative.

Our prevailing strategic concept relies upon nuclear retaliation and destruction in a general nuclear war as response for *any* overt military challenge. Let us review the bases of the rise and decline of this strategy.

"Strategy of destruction"

Military strategy, in the classical tradition, aims at defeating the enemy's military forces. The ultimate objective is to impose one's will on the enemy.

Our century has witnessed a technological revolution which posed the question of whether the enemy's military forces should necessarily remain the priority objective. General Giulio Douhet, the Italian airman, was among the first to insist, provocatively, that to win a war you need, not to destroy the enemy's armed forces, thus (or then) subduing his will to fight, but to *directly* destroy the will to resist by attacking his population and the war-making potential in his industry and transportation. Douhet and others stressed the enemy's population even more than his economy as the alternate and "preferred" target. Accepting the classical definition that the aim of war is to compel the adversary to do one's will, the new theoreticians—especially the advocates of offensive air power—proposed to achieve this objective by direct action on the seat of the will power of the enemy nation: the collective morale of its citizens. Douhet's influence must not be dismissed because he greatly exaggerated the power of high-explosive bombs; nuclear weapons have done much to "rescue" his forecasts. This may explain the influence of his ideas on today's military thought, particularly in the United States and the United Kingdom. But aside from the influence of Douhet and other theoreticians, it was logically essential that the newly emerging concept favoring action against the enemy's war-making potential and will to fight, rather than against his forces in the field, should seize upon the new weapons best able to accomplish this mission: those capable either of *attrition* or *destruction* of the enemy's economy. The archetypes of these classes of weapons were the submarine and the bomber airplane. Submarines and other weapons of attrition by blockade (including air power so applied) are more limited in the range of strategic situations in which they can serve, since they can be decisive only against an opponent whose very conduct of war is critically vulnerable in the transport of raw materials, weapons or combat reinforcements.

THE STRATEGY OF DESTRUCTION BECOMES A DEAD-END STREET OF SELF-DEFEAT

The two primary types of strategy that disrupt war-making potential are attrition by pressure on economic "bottlenecks" through blockade or selective bombing, and destruction of the entire industrial and transportation system through bombing. There are, of course, gradations between these two basic methods, in particular "vertical bombing" or precision bombing of one or several key industries in order to create serious bottlenecks. But such target systems tend necessarily either toward the attrition or the destruction strategies, depending upon the number and location of the industries attacked, and the explosive power used.

Before and during World War II, the attrition strategy was, in fact, the only one practicable with the weapons systems at hand (although this was not then conceded by many advocates of strategic bombing). Since the development of long-range bomber aviation, long-range missiles, and especially nuclear weapons, there can be no doubt of the physical effectiveness of the massive long-range bombing strategy. Indeed, the development of nuclear weapons has so tremendously increased possibilities for destruction, that a strategy aiming at disrupting the enemy's

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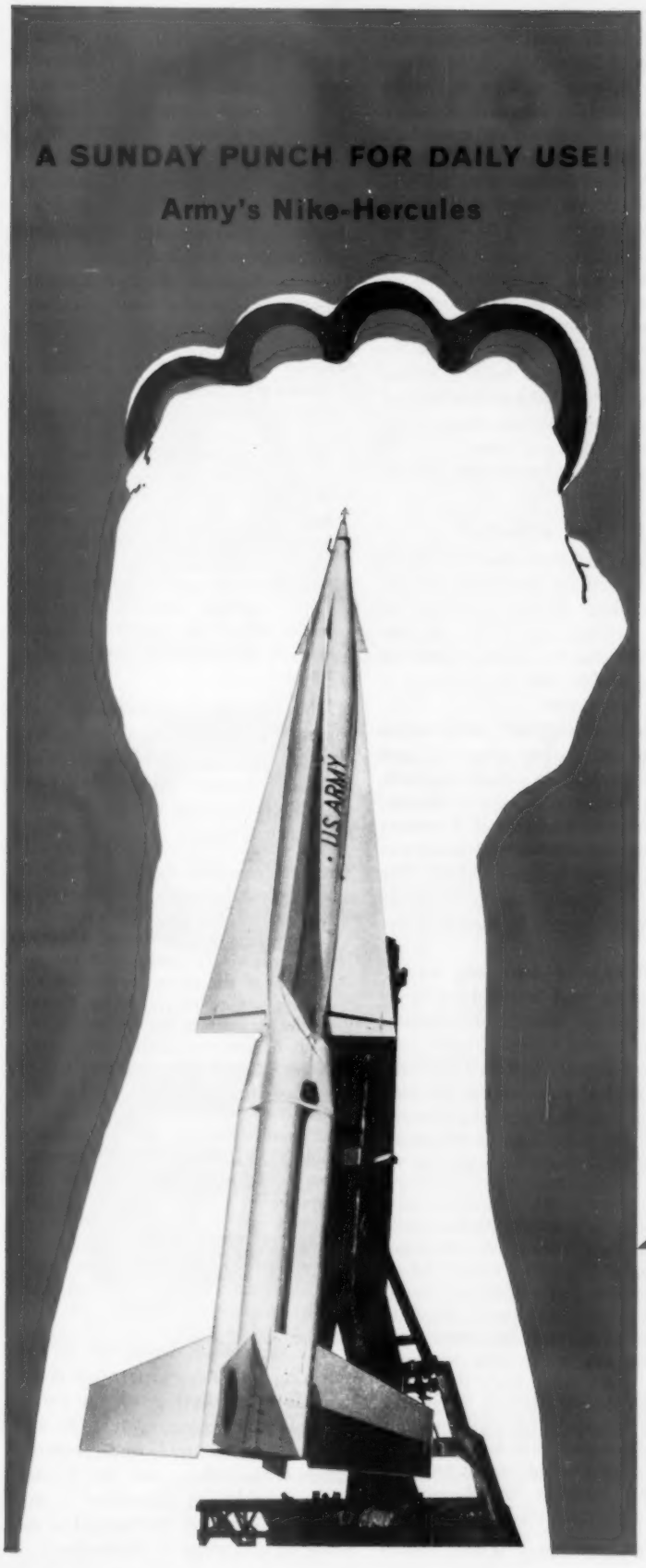

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war-making potential by attrition and blockade is clearly inferior technically to one promising immediate annihilation. Consequently, the state of the art now makes the strategy of destruction inherently superior to the strategy of attrition.

But if the strategy of destruction has become more *efficient* than alternative methods, it has not necessarily become more advantageous. Look at the picture from the standpoint of the attacker. Particularly if the objective of war is conquest of resources which would be reduced to radioactive ash by the most "efficient" strategy, the lesser efficiency of another basic strategy (not necessarily attrition) may be more than compensating. For this reason, the attacker may not choose this strategy. More basically, since survival is the ultimate objective of any state with rational leadership, no gain is meaningfully possible without self-preservation. To carry the axiom a step farther, no gain is possible unless it exceeds the loss resulting from the choice of a strategy. A strategy of mutual devastation bordering on annihilation contains no attractions for an aggressor.

If the defender is given the option of averting a strategy of mutual devastation, obviously he is well advised to avoid this most "efficient" strategy in favor of another. The cardinal American objective is security of the United States from physical destruction or military defeat and capitulation. It follows that any strategy we adopt in pursuing this objective must not entail either of these unacceptable conditions.

The emergence of a situation of mutual ability to deliver multimegaton salvos compels reexamination of any strategy relying upon their use. Clearly, a stalemate is not only likely, but even more desirable to *both* parties than would be the employment of these capabilities in mutual near-annihilation. Thus, reliance upon a strategy of destruction may advisedly decline to the point of rejecting the strategy, as the enemy acquires a like capability. If implementing such a strategy will provoke retaliation in kind, an alternate method is urgently required in the interests of self-preservation.

Several specific and technical conditions are necessary for this situation to prevail. Not only must our ability to annihilate an enemy exist; it must be sufficiently invulnerable to initial surprise attack so that our retaliation would actually mean his destruction. The general advantage of the offense over the defense (at least in the nuclear era), and the condition of nuclear plenty on both sides, make mutual the ability to devastate with small forces. Not only can a fraction of either SAC or the Soviet long-range air force deliver a terribly crushing blow, but naval or even tactical fighter aircraft or missile-launching submarines can deliver potent one-way nuclear strikes. The future prospects for IRBM and ICBM will preserve and reinsure the invulnerability of at least a critical minimum striking power. Nuclear parity—the ability to deliver mutually incapacitating blows—is here and will continue under foreseeable circumstances.

Strategy goes rigid

Yet, despite the obsolescence of our strategy of massive retaliation and destruction since Soviet acquisition of strategic striking capabilities, we continue to fashion our military structure in terms suitable only for a strategy of mutual destruction.

American strategy had, even before the advent of nuclear weapons, gone far toward replacing a traditional strategy of attrition with one of destruction. Strategic bombing of Germany comprised a substantial and rising proportion of our military effort. The tendency to develop strategy in this direction was enhanced by nuclear weapons.

The strategy of destroying the enemy's morale and war-making structure by strategic bombing has become dominant in the United States. It is not wholeheartedly endorsed by many military leaders, especially in the land and sea forces. For example, General Matthew Ridgway restated effectively the traditional point of view in his memoirs:

> *True victory in war is obtained only by defeating the enemy's armed forces,* destroying his hope for victory and his will to resist, and establishing control over his land and people. Mass destruction of his industrial resources is only one way to neutralize his capacity to wage war. Such destruction may not destroy his will to resist; it may strengthen his determination. Such destruction may have little immediate effect on his armed forces. It does not establish control over his land.

The current strategy is also diluted by the increasingly difficult primary defensive task of blunting the enemy's strategic bombing capability. But it remains the predominant prevailing concept of how a war is to be *won in the final analysis.* This is not contradicted by the fact that, as the enemy's strategic capability grows, his essential defensive counter air actions must be given priority. The Air Force manual *Air Doctrine: Strategic Air Operations* defines "the function of strategic air warfare in global strategy":

> Strategic air warfare is *the primary offensive manifestation of national power in war because of its direct destructive influence upon the social structure and war-making potential of an enemy nation.* The primary function of forces engaged in strategic air warfare is to defeat the enemy nation. Strategic air operations, therefore, basically are designed to destroy or render ineffective the crucial portions of the enemy nation's structure—those elements within the enemy's homeland vital to its continued prosecution of the war.

This doctrine concludes—and assumes—that destruction of the enemy's ground forces in various theaters is not necessary, because control over them will dissolve and his will to resist will have been broken.

> Thus, the capability exists to deliver attacks which horizontally will destroy or seriously reduce the total war-making capacity of a modern nation. These effects will not be confined to any one segment of the enemy nation but *will disrupt his entire capability. Control of the* population and *military forces will become virtually impossible* through loss of communication and organized control mechanisms. Provided that the entire attack is delivered in sufficient weight in the shortest possible time, collapse of the nation for war purposes will be inevitable. The rapidity of collapse will be directly proportional to the timing and weight of attack. Strategic air operations are designed to disrupt an enemy nation to the extent that its will and capability to resist are broken.

If a strategy of destruction is self-defeating, a strategy of attrition is not a possible substitute given the conditions of Soviet economic autarchy and internal lines of supply and communication. What, then, *can* the United States consider an alternative to our current reliance on thermonuclear air power in a strategy of destruction?

R

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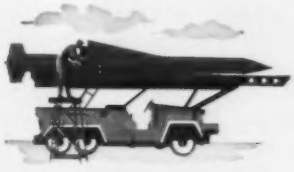

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A 'TRADITIONAL' STRATEGY EMERGES AS A NEW AND PROMISING ONE

The term "traditional" conjures up images of something outmoded and lagging. But in effect, the once traditional strategic concept of gaining political objectives through judicious application of military power now is a radical, new, and necessary alternative to the current overreliance on a simple strategy of destruction which if unleashed would incur also destruction of ourselves. A return to strategic thinking—that is, thinking of strategy as a means of achieving objectives rather than merely as the product of weapons development—is desperately needed. Such a reorientation of our thinking necessitates the framing of alternate strategies to meet varied situations. It does not mean a "moralistic" or any other escape from the realities of nuclear warfare; on the contrary, it faces these realities most directly.

The weapons of a strategy of destruction are still needed, but in a new context. SAC continues to serve as a deterrent to enemy use of his like capabilities in peacetime and in limited war, and in the strategy of last resort as a key element in total war. But while a powerful and sufficiently invulnerable nuclear striking power (SAC, including later the ICBM) remains an absolutely essential element of our military strength, under a flexible strategic concept it is not the *only* essential form of military strength.

The Soviet Union may take advantage of a mutually beneficial stalemate to pursue vigorously policies to her advantage and contrary to the interests of the free world. If the United States has a strategy and a corresponding military capability aimed *only* at deterring an enemy from total war by threat of total (but mutually destructive) retaliation, the Soviets may calculate (possibly correctly) that for lesser provocation than direct attack upon the United States, total retaliation will not be made. Moreover, will other nations have confidence in our ability and resolve to invoke a virtually suicidal nuclear strategy to save, say Iran —or even West Germany?

A choice of piecemeal surrender of individually non-essential friends, barriers, and redoubts overseas, or adoption of a suicidal strategy of massive annihilation, would be a terrible dilemma indeed. The consequences of the former choice *might* be eventual defeat; the consequences of the latter would lead to great destruction.

But if these "choices" are ever faced, the dilemma will be largely of our making. It shows not a failure of a policy of deterrence, but that the threat of retaliation by total destruction may deter only total wars. The "total" or ultimate deterrence, and the maintenance of forces necessary to impress its seriousness (an invulnerable intercontinental nuclear striking power), are essential, but not sufficient. To deter from a lesser threat—or failing deterrence to meet a lesser threat in combat —appropriate capabilities of lesser retaliation are necessary.

A military policy based on a strategy of graduated deterrents can mean two things: reliance upon "tactical" (local) use of nuclear weapons to meet local aggression and provocation; or reliance upon "conventional" (non-nuclear) weapons for that purpose. Some who have approached the problem exclude one or the other. For example, some writers propose a "counter-force strategy" promising the use of nuclear weapons against military targets to counter conventional local attacks, in order to maximize deterrent effect. Others leave open the question of tactical use of nuclear weapons, implying that only in cases where conventional forces cannot meet the challenge might nuclear weapons be locally employed. Some call for no use of nuclear weapons.

Restraint, not abandonment

In rebuttal, it has been claimed that "abandoning" our "strategic" nuclear power is tantamount to defeatism. Actually, no one has proposed "abandoning" this strength, but restraint in its use has been suggested, based upon considerations of mutual advantage. We cannot escape the consequences of reciprocal nuclear blows by pointing to problems in framing alternatives. One line of solution is the tactical use of nuclear weapons; another is the increase of conventional forces. While there may be no virtue in attempting to match Soviet conventional forces on a *quid pro quo* basis, the facts of mutual nuclear deterrence may, under certain circumstances, even make conventional war advantageous to us, despite the Soviet's relative advantage in such forces in being. Soviet alternate abilities for total nuclear war, limited nuclear war, and non-nuclear war *can* be met. If the atomic bomb had never been created, would the United States and the West have conceded their defeat by the Soviet Union? No. The United States and its allies have the *potential* capability now to hold Soviet power in check with conventional strength alone, especially when reinforced by tactical nuclear weapons, and supplemented by the ultimate nuclear deterrent to total war.

Military strength has two purposes: deterrence from war, and ability to wage and win a war if deterrence fails. Only during the nuclear era have we raised "deterrence" to the level of a major objective, yet recently we have tended to subordinate all other considerations to the maintenance of an absolute nuclear deterrent. In practice, this has meant budgetary and force parings of other components of our military structure. But we must note, first, that deterrence itself is a varied requirement—deterrence of what, and under what circumstances? Basically, it means inhibiting the enemy from beginning a war he would otherwise launch. In fact, there are deterrents—possibly key ones—quite apart from airplanes and bombs. For example, the Soviets might be inhibited from starting a war by concern over conditions within their own empire or by divergencies within the collective leadership itself. Even when considering our military forces as a deterrent we must recognize that the American image of what constitutes a proper and sufficient deterrent may not bear the same likeness in Soviet eyes. Their image of the forms and consequences of future war may lead them to evaluate deterrents differently—and of course there is no deterrent unless the *enemy* considers himself deterred. Thus, maintaining forces which the *Soviets* may, under their strategic concept, consider necessary for possible future wars, is our real requirement for deterrence. One can easily judge from the Soviet military establishment that they grant the importance of a widely diversified military capability, including substantial modern ground and tactical air forces

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as well as long-range air forces carrying nuclear bombs.

Finally, as we have noted, a military force must be able to wage war effectively if deterrence fails.

Let us now review briefly the possible major types of wars which may occur, and very generally sketch the capabilities required to implement an appropriate strategy for each.

WHO DEALS WITH THE ANTAGONIZED SURVIVORS OF A NUCLEAR HOLOCAUST—AND HOW?

Since general, unlimited or total war is the most familiar (if still obscure) prevailing image of possible future conflict, it is not necessary to discuss all its aspects. The mutual devastation by nuclear assault and retaliation may seem to leave little room for other military operations (except, of course, strategic defense). But, in fact, it may be that in such a case substantial Soviet ground forces would continue operations despite—or because of—devastation of their homeland. The balance of military power in such a situation is difficult to foresee, but the Soviets might well be able to seize much of Europe. However, chaos in the Soviet Union itself may offer significant opportunities for direct intervention. But mobile armies would be immediately needed, *both* for defense of Europe and for possible seizure of control in the Soviet bloc, and air transport to carry them quickly to critical areas.

It is common to hear the idea expressed, among those who profess to see no significant role for ground forces in general nuclear war, that the initial nuclear-air assault will be "the decisive phase," followed by a secondary "exploitation" or mopping-up phase. Unquestionably, in a general war the initial exchange of nuclear bombs would be a decisive phase, but it would not necessarily, or even probably, be *the* decisive one. It would be decisive in the sense that it would indeed be crucial not to "lose" this phase one-sidedly, but not in the sense that these operations would *decide and ensure a favorable outcome* for the side that racked up the biggest tally of H-bombs. The subsequent abilities of the contestants to recover, advance, seize and reconstitute what was left in the world would also be a decisive phase. Moreover, this latter stage—exploitation phase, if you will—is not necessarily predetermined by the initial air campaign, for, as we have noted, substantial available mobile ground forces would play an irreplaceable role. A single division can defeat the remnants of a dozen, but if that one is not available for weeks or months, the dozen may constitute an army. Thermonuclear devastation may, one can safely surmise, antagonize the survivors. It is not enough to destroy the Soviet long-range air force, important though that objective would obviously be. The Soviets are well aware that only ground troops can fully control territory and its inhabitants.

It seems difficult to visualize a general Soviet-West war in which nuclear weapons are not employed. But the *mutual absolute* advantage in not using nuclear weapons may at some stage outweigh the relative advantage of the Soviet Union and lead to our reluctance to use them. Even in such a war, Soviet advantages would probably be ephemeral, although there would be the danger that great initial Soviet successes might lead us and our allies to accept a compromise peace under which the USSR would retain certain gains. At least, they *might* sometime reason that such gains could be obtained, and therefore launch a general war in Europe without using nuclear weapons, relying on our fears to deter us from seizing the initiative—and onus—of making nuclear rubble of central and western Europe. Even though this eventuality may, especially under present or predictable circumstances, be scarcely probable, we must not ignore it. One safeguard against such a contingency would be an increase in "conventional," non-nuclear weapons (and a resurrection of the now discarded Lisbon force-goal of ninety NATO divisions). Another is to indicate clearly our readiness to encounter either limited nuclear or non-nuclear attacks with limited nuclear warfare of our own. Clearly, in either case, we would need substantial ground forces and supporting air power, both for deterrence and for action should deterrence fail.

The third type of possible wars are local or peripheral, limited to a particular region. With or without nuclear weapons, local wars require immediately available ground and supporting air forces that can rapidly deploy to the threatened area.

THE NATURE OF FORCES THAT ARE ADEQUATE TO THE POSSIBLE CHALLENGES

The possible types of future war—total nuclear war, limited nuclear war, non-nuclear major war, local nuclear war, and local non-nuclear war—have six essential major components in common.

(1) *Strategic thermonuclear striking power* is needed in total war to crush the enemy's long-range weapons systems, subsequently other components of his military strength, and possibly his basic capacities for war. In all other possible wars this force would not be employed (except, perhaps, to a limited degree against distant tactical military objectives), but its very presence would be essential to enforce whatever limitation on the weapons and theater a given war would have. SAC currently meets this need, although constant attention must be given to preserving its strength and invulnerability.

(2) *Strong, readily committed ground forces* are essential for all possible types of war. Their role would vary with circumstances, but they are necessary for all, including total nuclear, wars. To prepare in advance for the very large force required for a general non-nuclear war would not be desirable because of its unlikelihood. But preparations for a moderately sized, readily committed force *plus* the cadre for mobilization of a larger force is not only feasible, but desirable and prudent. While it is difficult to be precise about the size and composition of the minimum force needed to meet all these contingencies, it would seem that its present and planned strength is not sufficient. At this writing the U. S. Army had eleven infantry di-

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visions, four armored divisions, three airborne divisions, and nine infantry regimental combat teams; the Marine Corps had three amphibious infantry divisions. Under the program for 1957-58 two infantry divisions will be inactivated, an armored division will be reduced to a combat command, and four or five missile commands (presumably RCT size) are to be created. Remaining divisions will gradually be converted from the triangular regimental organization to the pentomic (five combat commands) structure, with manpower in infantry and airborne divisions reduced. This organization leaves armored, infantry, and airborne divisions capable of either nuclear or non-nuclear combat, although the staying power of the infantry and especially of the new airborne divisions in non-nuclear warfare will be lessened. The Army missile commands will back up Allied ground forces in various theaters—an excellent step in preparing for the contingency of general or local nuclear war. The supporting missile commands will have little combat value in a non-nuclear war; their substitution for several "dual-purpose" divisions represents a weakening of capabilities for possible non-nuclear wars. Missile commands certainly should be created, but as additions to forces that can operate effectively in either nuclear or non-nuclear war. For immediate action in peripheral areas it would be desirable to increase the number of airborne divisions. But most essential is the conversion to air transportability of *all* divisions, including armored ones. To meet the various war contingencies described, a minimum ready force might be four to six airborne divisions, six armored divisions, three or four marine divisions, ten to twelve air-transportable and fully mechanized pentomic infantry divisions, six to eight RCTs, and six to twelve missile commands.

(3) *Sufficient strategic air transport* to commit required ground forces swiftly is a parallel necessity. Authoritative sources admit that we do not have enough aircraft to move even one division in a single lift. Strategic airlift capabilities additional to other air-transport requirements of all the services are needed. The need for rapid movement in local wars is apparent: had we been able to transport two divisions to Korea in June 1950, we would probably not have had to commit seven Army and three Marine divisions later. To have the air-transportable divisions is one urgent need; to have the needed air transport is another.

(4) *Adequate naval power to command the seas* is essential to our military forces. Ability to defend our sea lanes and coasts from hostile action (especially by submarines and submarine-launched missiles) is an urgent one, as is the capacity to reinforce and supply our own and allied forces overseas. A third is offensive action by naval and marine forces against enemy maritime objectives, including action by guided-missile ships. Fortunately, the U. S. Navy continues to be properly provided to meet these needs.

(5) *Tactical air power* to support theater operations by U. S. and allied ground forces is an evident requirement. Yet, rather than increasing our over-all still weak theater strength, the Air Force is to be reduced by seven or more fighter-bomber wings during 1957-58. The reason given is that the Army's missiles provide close support. However, such increased capabilities should not lead to replacing existing tactical air power but to freeing it for other essential missions. The justification offered for this and other reductions, that "our over-all strength is not reduced," begs the issue: we must not only maintain but constantly build and strengthen our military power. Tactical air power (and ground strength) is a deterrent to limited wars just as strategic air power is a deterrent to total war. It is necessary both for rapid commitment to local theaters in limited peripheral wars, and for general air superiority and support missions in all types of wars. It might be desirable for Army divisions to be given the organic close air support that Marine divisions have, permitting the Air Force to concentrate on its air-superiority mission.

(6) *Strategic air defense of the United States* is the last, and obvious, necessary element of over-all military power. Continued maintenance and improvement of our strategic ZI air defense system is receiving close attention. One important open issue is the problem of developing effective civil defense measures.

THE RETURN OF WAR TO ARMED CONFLICT ON THE BATTLEFIELD

While all six of these components are essential, they cannot really be listed hierarchically (and the above sequence does not attempt to do so). No one or two or five can be substituted for others. It is apparent, though, that under the presently prevailing strategic concept the second, third, and fifth (ground forces, airlift, and tactical air forces) have been under-procured. An increased military budget and possibly a higher rate of conscription—not popular prospects—would bolster these elements, for others are at a minimum. Measures for attaining a proper defense posture must not be subjected to political expediency.

The proposed strategic concept has two features lacking in our current concept. One is a return to correlation of the means with the end, the strategy with the objective. Our real objectives clearly differ in cases of, for example, a local Communist aggression against Iran or a Soviet nuclear attack on the United States. "Massive retaliation" may have been a sufficient answer to multiple challenges when we had a nuclear monopoly or even preponderance, but not as it begins to mean in fact either bluff or virtual mutual suicide. The second and related feature is a return to emphasis on destroying the enemy's military forces rather than his population or economic resources and capacity for war. Douhet's views were not only "proved right" by the nuclear weapon; they were also made obsolete by it.

A strategic concept allowing flexibility of force, and providing the basis for capabilities that fit various forms and degrees of armed conflict, does not diminish the option and ability to wage total nuclear war. It does dissuade us from excessive reliance upon this strategy of last resort and restores opportunities for selecting and using effective strategies and forces in circumstances where limited objectives are better served by limited wars.

It has been said, in referring to the various possible conflicts other than a general nuclear war, that "we can't afford" them. Indeed, they are the only wars we *can* afford.

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AFTER 1000 FLYING HOURS—The lead aircraft in this formation of five Army H-37As (Sikorsky S-56s) over Fort Rucker, Ala., completed 1000 hours of accelerated test flying within six months after delivery, a unique record for helicopters.

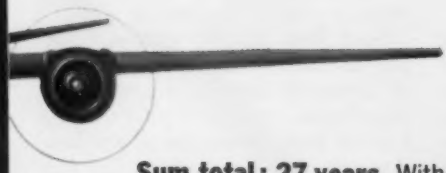
A new Army command, the Transportation Aircraft Test and Support Activity, conducted the unprecedented testing program. The big H-37A was the command's first assignment in a program designed to develop a system to provide engineering data.

OVER ANTARCTIC ICE—A Navy HO4S (Sikorsky S-55) hovers over the Coast Guard icebreaker *Northwind* in the Antarctic, supporting U. S. participation in the activities of the International Geophysical Year. Sikorsky helicopters are vital to the exploration and development of hard-to-reach areas the world over.

OVER THE BEACHHEAD—A Marine Corps HUS (Sikorsky S-58) takes off from the carrier Leyte during exercises in the Caribbean. The HUS normally carries up to 12 passengers, or even more for short distances. Current Marine Corps tactics emphasize vertical envelopment of enemy areas using many transport helicopters.

SIKORSKY AIRCRAFT
STRATFORD, CONNECTICUT
One of the Divisions of United Aircraft Corporation

NAVY
GRUMMAN



Sum total: 27 years. With many firsts along the way. The first military plane with retractable landing gear. The first carrier-based aircraft with folding wings. First swept-wing jets on operational service with carrier squadrons. First in the air with area-rule (coke bottle) fuselage for fighters. The first aircraft capable of performing the complete search-attack mission against subs. First in amphibians with the production of more such craft than the rest of the world combined. First with two-place transonic jet fighter-trainers.

Sum total: more than 24,000 planes. Ready in quantity when needed. At minimum cost to our government. And backed by unexcelled operational and maintenance field support throughout the world. Small wonder Grumman products have been in uninterrupted service every day of every year since 1930.

EXPERIENCE

GRUMMAN AIRCRAFT ENGINEERING CORPORATION
Bethpage • Long Island • New York
Air Superiority Fighters • Anti-submarine Aircraft • Jet Trainers
Air Transports • Nuclear Research • Aerobilt Truck Bodies
Hydrofoil Research • Grumman Boats

THE MONTH'S CEREBRATIONS

COMMANDERS AREN'T COLLECTION AGENTS

LIEUTENANT RICHARD P. FOX

ONE slight revision of AR 600-10 would do much in the interests of both Paper Chase and enhancing the job of the small-unit commander. I refer to that part of Change 3 to AR 600-10, which says, ". . . the organization commander will . . . reply to [inform] the complainant. . . ."

This seemingly innocuous and just provision of the military discipline regulation requires an untold amount of useless letter-writing and administration by the man on the end of the line of indorsements: the company or battery commander. Of course, part of a commander's job is to insure that members of his unit, who act in such a manner as to bring discredit upon the Army, are punished. A soldier who incurs debts with no intention of paying them, should be punished. But why can't the entire matter be left to the judgment of the unit commander?

Letters of indebtedness may seem a small problem, but at company level the flow never seems to stop. They present an administrative problem, of which the bulk could be eliminated by AR 600-10 suggesting rather than directing that all such letters be answered.

The majority of businesses extending credit to military men are reputable and honestly intend to sell their merchandise. However, there are firms which specialize in "Easy Credit—Any Rank." The no-money-down people, who aim at the soldier because they know commanders must interview the alleged debtor and answer the creditor's letter each time one is received. Such firms operate on the assumption that, although a soldier's pay cannot be garnisheed, a company commander makes a wonderful collection agent.

Such firms extend credit to Army privates which they wouldn't dream of giving civilians in a comparable wage bracket. I've seen a letter alleging a small indebtedness for a purchase that took place years before. This was obviously, although impossible to prove at first, an attempt at fraud. It was attempted in the hope the sergeant concerned had lost or destroyed his receipts for his payments—which fortunately he hadn't.

In such cases, where the alleged creditor is obviously either shady or a plain crook, I think the commander concerned should have the option of tossing further correspondence from the same firm into the trash basket.

***Lieut. Richard P. Fox** is assigned to the Air Defense Center, Fort Bliss, Texas. He wrote "Give the Youngsters a Chance," in the April issue.*

This department is designed to accommodate the short, pithy and good humored expression of ideas—radical and reactionary, new and old. We pay for all contributions published but you deserve to be put on notice that the rate of payment depends upon the originality of the subject and the quality of writing rather than length. This department is hungry for contributions, so shoot that good idea in . . . today.

LET THE STUDENT SELECT

MAJOR DAVID L. JONES

A MAJOR problem confronting a service school each year during its regular advanced course arises out of the varied backgrounds of its students. Officers who began their service school education on fairly even footing have progressed, by the time they reach this level, through so many different kinds of assignments and experiences that a mass of preliminary instruction has to be pitched at them in an attempt to arrive at a common level of understanding. Only then can the truly "advanced" part of the course begin.

Let's look at this leveling process in the Artillery Officers Advanced Course at Fort Sill. The field artilleryman may be utterly bored with those same old classes in gunnery and matériel, yet find the pace too swift in new, to him, antiaircraft subjects. These same subjects may be old hat to the antiaircraftman in the next chair, but he, in turn, gets a tremendous bellyache from trying to digest so much field artillery in so little time. The officer who has just finished a troop assignment as a communications officer is perhaps lost in survey math, while the ex-intelligence officer may never have seen an artillery missile. Since in each subject someone is certain to require initial or refresher instruction, all students are taught everything, whether they need it or not. The course gets longer and longer, students become increasingly unhappy, interest lags, and learning stops.

In their search for a solution, service schools have picked the brains of their faculty and solicited suggestions on course content from the students themselves. Naturally, comments are as varied as individual backgrounds. One suggests more emphasis on this subject, another on that. These comments form, to a certain extent, the basis for the next year's leveling process.

Much as the school values these comments, action on them always affects the following class rather than the class that made them. So far as I know, no one has yet proposed that an incoming class be allowed to select, in advance, its own subject areas for preliminary

Target Team

The U.S. Army's ground-to-air missiles require realistic training targets with speed, altitude capability and radar reflectivity that closely approximate the same characteristics of an invading enemy aircraft. In matching these specifications, however, cost becomes a major consideration.

By air launching a rocket target from a drone at high altitude, the cost of development and operation decreases and the training program gains efficiency. From these critical requirements grew Radioplane's concept for the RP-77DL and RP-76A target team.

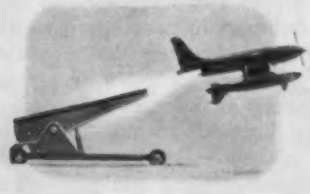
Radioplane's turboprop drone, the RP-77DL, is ground launched carrying the rocket-powered RP-76A target. Upon reaching scheduled altitude the RP-76A blasts off to complete its target mission. The RP-77DL then returns to launch site under radio control to be readied for another team launching. Both the launch drone and the rocket target are recoverable by parachute.

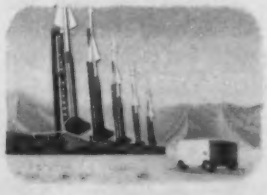
First in the field of producing remotely controlled aerial targets, Radioplane continues this vital production while developing economical aerial target systems for tomorrow's missile training programs.

Radioplane

A Division of Northrop Aircraft, Inc.

VAN NUYS, CALIFORNIA AND EL PASO, TEXAS





instruction. We always assume that teacher knows best, and point with pride to files of statistical analyses of previous classes to back us up.

Suppose, for the sake of argument, that such a radical idea were adopted. Here's how it might work.

The service school selects subject areas in which brief, concentrated, refresher-type instruction is offered during the first few weeks of the advanced course. These quickies are long enough and frequent enough to give the student maximum freedom of selection, within the school's support capability. During registration each advanced course student elects subjects in which he feels he needs refreshing. After this preliminary specialized instruction, all students proceed into advanced study.

It is true that a person is not necessarily the best judge of his shortcomings. To assist the student officer in selecting his subjects, let the school assign a field-grade faculty member as his advisor. By interview and use of Form 66, the advisor can steer him into instructional areas which best fit his needs. The occasional irresponsible officer who chooses the path of least resistance, despite his advisor's counsel, must blame only himself when the going gets tough.

By now you may have recognized this system as that used in most colleges and universities. Perhaps you recall from your own experience that even at tender college age you were considered capable of selecting, with a faculty advisor's help, many of your own courses. We can hardly claim, in the same breath in which we cry for more responsibility for the officer, that an advanced course student is incapable of making a similar choice.

The method I propose would result in each student's receiving the particular instruction he needs to prepare him for advanced study. He need not sit through unnecessary subjects simply because other students are weak in them. He will be a more satisfied and, I think, a better, student.

The length of the course could be cut. This would not only release the student sooner for productive duty, but would reduce the instructional burden of the school.

Our service schools have an enviable reputation. In some respects, notably in methods of instruction and training aids, they surpass most civilian universities. But in senior course orientation, our service schools might well take a tip from their civilian counterparts.

Major David L. Jones, Artillery, *was commissioned in 1942 and served in Europe in World War II. Recalled in 1950, he served in Korea. He is now on the Faculty of the Artillery and Missile School at Fort Sill, Okla.*

DISSENTING NOTE ON INCENTIVE AWARDS

CAPTAIN CARL M. GUELZO

SOLDIER and civilian employee alike have been so deluged with official encouragement to contribute ideas and suggestions, that the Incentive Awards Program is accepted with almost religious fervor. Perhaps that is all to the good, but with pressure mounting to extend full application of the program to the soldier, a somewhat closer look is warranted before any high-pressure lines are tapped into the public coffers.

Of course, no large organization should be without a suggestion program. In this respect, advocates of the program are incontrovertibly correct. Employee suggestion plans have proved too successful in industry and in the Government service to justify an attack on the basic idea. The underlying philosophy is not, however, so good that such a program should be regarded as sacrosanct.

Since statistics are impressive, we'll quote some. We are told that during fiscal 1956 the Army paid out $417,726 in prizes to employees for ideas and suggestions which saved it more than $17 million—$40 for each one it put out. In addition, $39,825 went to employees for superior performance over extended periods, or who did outstanding work on special projects. Although these performance awards cannot be evaluated in terms of dollars-and-cents, the Government experts figure they saved $704,353—or almost $18 for each dollar awarded. They contend that benefits to morale, efficiency and quality of work product were too intangible to be evaluated in direct dollar savings.

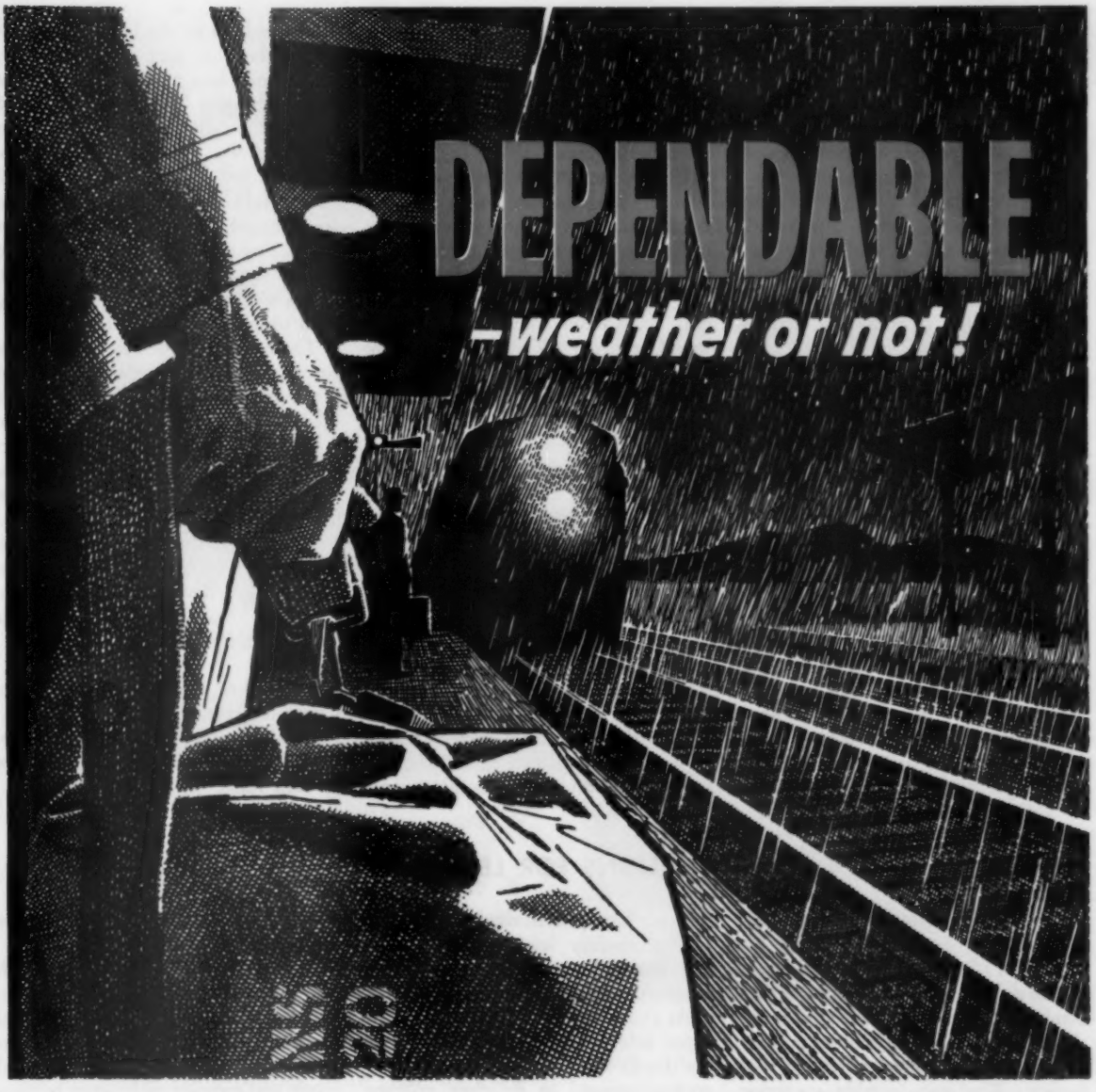
But do we consider the costs of administering the program—the time, labor, materials, machines, and the salaries of people who make the program work? The figures cited are not actually bookkeepers' or accountants' figures from budget records. Some, of course, are actual savings, but others are very careful estimates. Before an award is approved, the savings claimed must be fully documented, and many of them are scaled to the amounts saved. However, when an award is made and the project abandoned, the Government misses out, because no one finds out if the projected savings were actually produced as estimated.

The costs of operating the Incentive Awards Program can be judged by the steps that must be followed for each suggestion submitted. Supervisors are supposed to encourage and assist subordinates in developing worthwhile ideas. However, the suggestion box sidesteps a supervisor who tries to prevent submission of a poor suggestion, and compels attention to the idea.

The suggestion goes to the executive secretary of the unit or installation Incentive Awards Committee, where it is logged in, recorded, and acknowledged. This part-time or full-time secretary is the permanent administrative official of the local committee, and usually has a clerical staff. In large headquarters, the paper may be sent out for reproduction to insure that enough copies are always at hand. A file is set up and the subject is evaluated to determine whether or not it has real worth. It is then referred to a technically qualified person or agency. When it alights on the desk of the person who must evaluate it, he must put aside his regular chores, no matter how pressing, and tackle the suggestion, since action is mandatory.

So the evaluator evaluates, and the suggestion goes back through message centers to the executive secretary, perhaps for more evaluations. When a complete picture of the idea's merit has been drawn, the secretary calls a meeting of the committee. Whether adopted or rejected, the secretary must send a personal letter to the contributor informing him of his award, or letting him down tactfully.

The whole program is much like shucking a mountain of oysters in the hope of eventually finding a pearl; for the unfortunate fact remains that a great many suggestions are utterly worthless. But the good as well as the bad must grind through the mill just the same. How widespread is this ad-



In any weather, individuals or group movements get there when they travel by train. They leave on schedule, travel on schedule, and arrive on schedule *as planned.*

That is why travel on America's railroads is the *best* military transportation. When there is a transportation job to do—let the railroads do it!

Reduced fares when on leave
...special discounts on Transportation Requests
Ask about Family Fares

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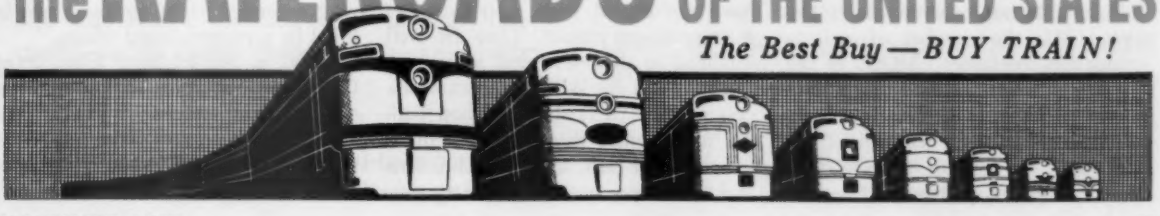

ministrative machinery? Every installation has a committee and a secretariat, as do many subordinate agencies. True, evaluators and committee members are only part-time workers, but the aggregate of time spent at all levels mounts rapidly as the program unfolds.

I do not mean that we should abandon the program, but to put it on a firm, paying basis devoid of its aura of righteousness and untouchability, I propose these changes:

In balancing costs against savings, determine the true value of the program by reckoning sums represented by both cash paid *and* administrative operating costs of awards. If nothing else, a more accurate estimate of the net savings should result.

Where an award in excess of $50 appears justified, withhold presentation for at least six months in order to accumulate enough experience factors upon which to base a firm determination that the savings are actually accruing.

Recommend Congressional legislation to make cash awards free of income tax. Witholding this tax embarrasses the commander who has authorized an award of $100, yet is able to give only $75.

Recognize the administrative costs of the program by adjusting personnel spaces and authorizations to reflect the added mission and heavily increased workload of operating an Incentive Awards Program.

Either exclude military personnel from the program completely, or equalize application of the program throughout the Army to both civilian and military. Against cash awards for ideas and superior performance by civilians, only the Commendation Ribbon and the Certificate of Achievement are awarded soldiers. There are other awards available for military personnel, but their use as rewards tends to discredit the program. I refer to such things as letters of commendation, with which 201 files now overflow; leaves, for which a soldier need only remain alive long enough to accumulate the necessary credits; and passes, which, depending on local command policy, can be had for the asking. Some agencies pay small amounts from nonappropriated funds on a limited basis (at least one scheme excludes officer participation), but the efforts are feeble compared to incentives offered civilian employees.

Establish firm guarantees that awards will go only to those who develop ideas which they, on their own authority, cannot put into effect. The quickest way to cheapen a program of this kind is to grant awards for ideas fully within the scope of a person's normal responsibilities. Awards to a high-ranking civilian employee for superior performance should be closely scrutinized to insure that standards are being applied which are appropriate to his job and grade, and that the award is not being used simply to augment his salary.

These suggestions may appear drastic, but there is no reason why good management principles and cost and quality controls should not be used in a suggestion program. The tremendous workload generated by the program warrants its recognition as a separate activity that should be reflected in the budgetary and fiscal allotments of any command. The basic purpose is to insure beyond doubt that the Government gets an adequate return, all costs considered, for every award dollar.

Capt. Carl M. Guelzo, Transportation Corps, *is a special assistant to the Executive Director, Military Traffic Management Agency. He wrote "Evolution of Staff Rank" in the July issue.*

COMMISSIONS FOR LEADERS ONLY

LT. COL. IRVING HEYMONT

TRADITIONALLY, the commissioned officer, while not necessarily a combat unit leader, is a leader nevertheless. Depots, service units and research programs cannot operate without leaders. The only notable exception to this general rule has been in the case of specialists requiring very extensive postgraduate training, like medical officers and judge advocates.

While we stress the imperative need of improving the Army's status and increasing the efficiency and prestige of its officer corps, we should also take a good long look at how we are using our officers. The cutbacks that now face us make this appraisal particularly urgent.

Even a cursory survey shows that since 1941, the number of military occupation specialties (MOS) of officers have grown tremendously. Many of these specialties describe jobs that are logically those of technicians, not of leaders. As a result we now have officers who are performing as technicians. Their duties require skills but not necessarily leadership qualities, even though many of these officers have previously proved themselves leaders.

As a case in point, look at the intelligence field. Starting with the mobilization for World War II, the number of people engaged in full-time military intelligence duties has increased tremendously, and rightly so. However, the increase has been primarily in military intelligence technicians, like order-of-battle and documents analysts, editors, interpreters-translators, photo interpreters, CIC agents, and interrogators. Many of these jobs are authorized commissioned-officer slots.

We now have many field-grade officers of the combat arms trained as intelligence technical specialists who have not served with their branches for significant periods. They are well qualified in their technical specialties, but have lost the skills required of officers in their particular branches. Failure to recognize that their specialties, for the most part, are for technicians and not officers, has resulted in the misuse of what I think is an intolerable number of officers.

Certainly, we must have leaders with firm technical backgrounds. The intelligence field, in particular, requires leaders who have broad combat-arms experience and who have also mastered subtle and complex techniques pertaining to intelligence as well. Officers are needed to lead in research and development within the technical specialties of intelligence and to command the specialized intelligence units like aerial reconnaissance and military intelligence battalions and their organic elements. But specialized duties that don't require broad branch training or experience should not call for commissioned officers. A position that has as its major requirement the ability to speak and read a foreign language need not be filled by a commissioned officer.

What is the solution? Eliminating the technical spaces would be unrealistic, for technicians are still needed. The answer lies in allotting warrant officers to fill these specialized intelligence technician spaces. Within the WO

What can you do with these "swimming trucks"?

TAKE the "Super-Duck" (inset)—direct descendant of the DUKW that won its fame storming the beachheads of the South Pacific during World War II.

With it, you can do 7 m.p.h. in the water—over a range of 63 miles. And you can pack an 8,000-pound load—3,000 pounds more than its illustrious predecessor carried.

Or take the "Drake" (top). It's the very latest in "swimming trucks"—an 8- to 10-ton, twin-engined, amphibious 8-by-8.

You can carry a 5-ton G.I. truck—a weapon the size of ONTOS—or carry most anything else within its 1,200-cubic-foot under-tarp capacity.

On land, you can cruise it at 44 m.p.h.—over a 400-mile range—maneuver it through heavy traffic—safely carry "handle-with-care" instruments or weapons, thanks to its Truck Air Suspension and controlled tire inflation.

On sea, you can move a trimmed-to-capacity load without swamping it—even in heavy going. You can go all-out at 10 m.p.h. with a 20,000-pound load. And it turns around in just about its own length.

You can service either the "Super-Duck" or "Drake" easily. For both are powered by GMC "302" engines—practically identical with those now used in 80,000 military vehicles. And they both have Allison TORQMATIC Drive—reducing both maintenance and driver-training time.

Can your Command use either of those vehicles to advantage? If you'd like to know more about them, we'll be happy to consult with you. And if you can use them, we can build them for you!

GMC TRUCK & COACH
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A General Motors Division

grade structure, there is sufficient opportunity for advancement and material reward.

While I have scrutinized the intelligence field in some detail, study of other areas would undoubtedly reveal similar misuse of officers as technicians. Technical positions should more correctly be for warrant and not commissioned officers. To be truly fair to technicians and leaders, commissions should be allotted only for the leaders.

Lieutenant Colonel Irving Heymont, *Infantry, who served in ETO with the 5th Infantry Division and in Korea with the 40th Division and ROK II Corps, is on the faculty of CGSC. This is his fifteenth contribution.*

WHY DON'T MAPS INDICATE THEIR RELIABILITY?

MAJOR ALVIN P. COLVOCORESSES

DURING the past fifteen years the Corps of Engineers has produced an enormous quantity of military topographic maps of critical areas throughout the world. These maps provide one of the basic tools of our armed forces. Unfortunately, our maps are not always accurate, complete or current. A modern military map contains a wealth of marginal explanatory data, but generally there is no actual evaluation of the finished map.

The only way the user can determine its reliability is by interpretation of the various marginal notes relating to sources and methods of compilation. This takes time and technical knowledge of cartography and even then will often lead to an erroneous evaluation. This is a matter of prime importance to those responsible for locating a target and siting a long-range weapon but it is also true that all map users need to know, at least in general terms, the reliability of their maps.

Searching for a feasible solution to this problem, I studied the existing systems and evolved a system of evaluation that I sent to various service agencies and individuals. I received more than forty comments, representing a reasonable cross-section of opinion including the views of our principal Army schools, boards and mapping agencies. For analysis, these comments were divided into two groups representing primary interest as a "map user" or as "map maker."

These three basic questions were asked:

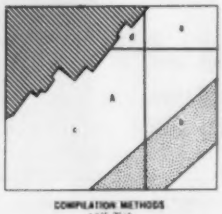
¶ Is there a requirement for a system by which topographic maps will be evaluated and marked as to their reliability?

¶ Is such a system feasible?

¶ What form should such a system take?

Prepared under the direction of the Engineer, Hq AFFE/8A, by the 29th Engineer Battalion (Base Topographic). Compiled in 1956 by photogrammetric (multiplex) methods utilizing sub-standard materials (reliability poor) and from China, 1:50,000, Chinese General Staff Land Survey, 1929, 1931. Planimetric detail partially revised by photo-planimetric methods. Original mapping by planetable methods by Chinese General Staff Land Survey, 1929, 1931. Names romanized in accordance with the Modified Wade-Giles System. Chinese characters added. Roads are classified from source maps and aerial photography and are not verified by reconnaissance. Map not field checked.

COVERAGE DIAGRAM



COMPILATION METHODS

Photo-stereo Photo-planimetric Map

A. China, 1:50,000, Chinese General Staff Land Survey, 4controlled ground survey, reliability poor
a. T'ai-t'ou-ying, 1929
b. Fo-ning-hsien, 1931
c. Shuang-wang chen, 1929
d. Yen-ho-ying, 1929
Aerial photography: Mar. 1945.

VERTICAL DATUM: MEAN SEA LEVEL

TRANSVERSE MERCATOR PROJECTION

HORIZONTAL DATUM IS BASED ON RED BRIDGE ASTRONOMIC STATION: 117°10'00" EAST OF GREENWICH, 39°09'43" NORTH

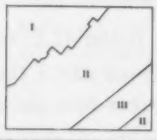
NOTE: THIS SHEET IS LESS THAN 10 MINUTES FROM RED BRIDGE - TŌKYŌ DATUM JUNCTION. TO CONVERT RED BRIDGE DATUM VALUES TO TŌKYŌ DATUM VALUES: ADD 522 METERS (22 SECONDS) TO EAST VALUE, SUBTRACT 185 METERS (6 SECONDS) FROM NORTH VALUE.

A MAP OF VARIABLE RELIABILITY

Marginal items which currently appear on an actual large-scale map of China and which refer to map reliability. These items are scattered along two sides of the margin of the sheet.

The map reliability notation for the same map as it might appear using the recommended system. This block of data would not entirely replace the existing items which refer to map reliability, but would permit their abbreviation.

MAP RELIABILITY



AREA	ACCURACY OF POSITION (AS RELATED TO LOCAL CONTROL) PROBABLE ERROR LESS THAN - HORIZONTAL	VERTICAL	COMPLETENESS OF MAP DETAIL - % OF SUITABLE FEATURES CORRECTLY SHOWN	GENERAL CURRENCY OF MAP DETAIL	RATING (DEFINED IN AR -)
I	FAIR - 50 METERS	FAIR - 40 METERS	FAIR - 70% TO 90%	1945	C-3-b
II	POOR - NO LIMIT	POOR - NO LIMIT	POOR - LESS THAN 70%	1929 - 31	E-5-c
III	POOR - NO LIMIT	POOR - NO LIMIT	FAIR - 70% TO 90%	1945	E-5-b

DATUM NOTES:
LOCAL HORIZONTAL CONTROL IS BASED ON RED BRIDGE ASTRO STATION.
LOCAL VERTICAL CONTROL IS BASED ON MEAN SEA LEVEL (CHINA COAST).
THIS SHEET IS LESS THAN 10 MINUTES FROM RED BRIDGE - TOKYO DATUM JUNCTION. TO CONVERT RED BRIDGE DATUM VALUES TO TOKYO DATUM VALUES: ADD 522 METERS (22 SECONDS) TO EAST VALUE, SUBTRACT 185 METERS (6 SECONDS) FROM NORTH VALUE.

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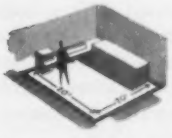
ALL-TRANSISTOR MANAGEMENT "BRAIN"

Here is the world's first and only large-scale, all-transistor data processing system . . . unsurpassed in capacity and performance. Transac is meeting the modern challenge for faster, smaller and more reliable large-scale data processing systems. Philco invites you to consider the many outstanding advantages of the new Transac S-2000 before you decide on *any* large scale data processing system.

Compare!



1/10 THE FLOOR SPACE. The complete Transac S-2000 system will fit into a 20′ x 20′ floor space. A tremendous economic advantage where space is at a premium.

Compare!

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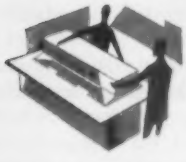
Compare!



MOVEABLE. Transac S-2000 can be easily moved from place-to-place if you find it necessary to relocate.

Compare!

NO EXPENSIVE SITE PREPARATION. No special reinforcing or ducting of floors, installation of power lines, etc., are necessary for quick installation or relocation of Transac S-2000.

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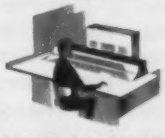

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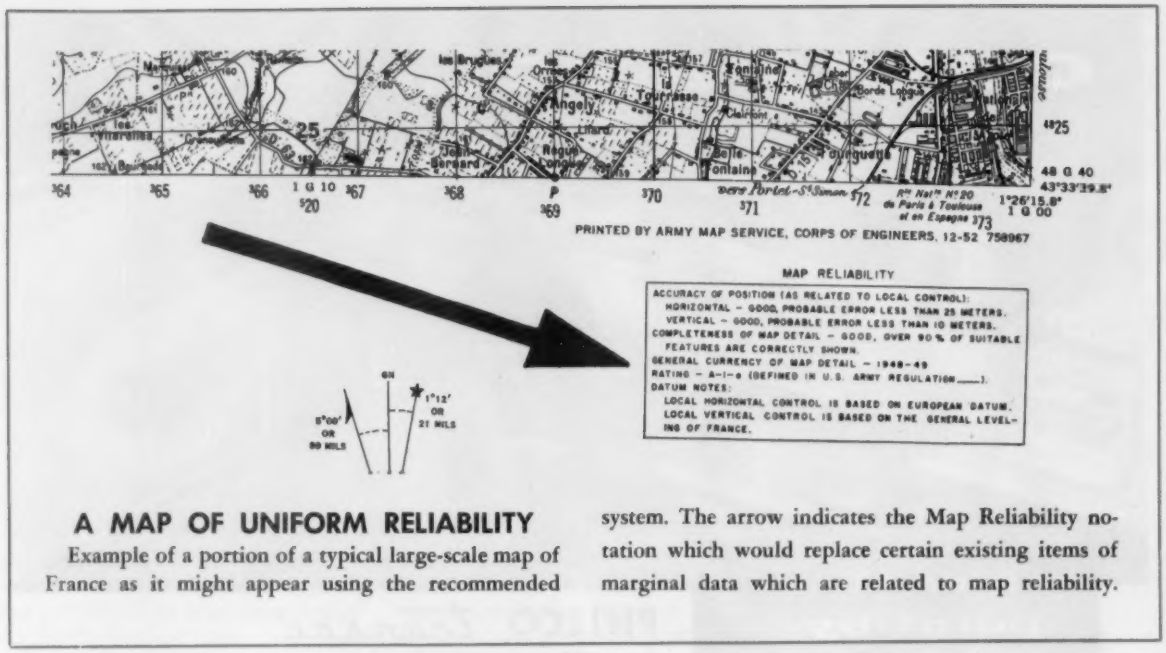
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MAP RELIABILITY
ACCURACY OF POSITION (AS RELATED TO LOCAL CONTROL):
HORIZONTAL – GOOD, PROBABLE ERROR LESS THAN 25 METERS.
VERTICAL – GOOD, PROBABLE ERROR LESS THAN 10 METERS.
COMPLETENESS OF MAP DETAIL – GOOD, OVER 90% OF SUITABLE FEATURES ARE CORRECTLY SHOWN.
GENERAL CURRENCY OF MAP DETAIL – 1948–49
RATING – A–1–a (DEFINED IN U.S. ARMY REGULATION).
DATUM NOTES:
LOCAL HORIZONTAL CONTROL IS BASED ON EUROPEAN DATUM.
LOCAL VERTICAL CONTROL IS BASED ON THE GENERAL LEVELING OF FRANCE.
1°12' OR 21 MILS
5°00' OR 89 MILS

A MAP OF UNIFORM RELIABILITY

Example of a portion of a typical large-scale map of France as it might appear using the recommended system. The arrow indicates the Map Reliability notation which would replace certain existing items of marginal data which are related to map reliability.

In answering the first question the comments of *map users* were given prime consideration. The users all agreed that maps should be evaluated and marked, and their reasons were basic and valid. The artillery and guided missiles targeting requirement for rapid determination of circular probable error (CPE or CEP) is a prime example. Other examples relate to air and land navigation, reporting and recording intelligence data and the general conduct of military operations. From the comments I received it became apparent that the military map user does require information as to the accuracy, completeness and currency of the map. Some map makers claim that the current treatment of marginal data gives adequate evaluation. To settle this point representative maps of foreign areas were given to non-technical and technical persons to evaluate. In all cases the non-technician was unable to make a satisfactory evaluation. In more than fifty per cent of the cases the technician (map maker) was also unable to make a satisfactory evaluation. This test was limited to the two basic criteria of accuracy and currency.

The second question, relating to the feasibility of such a system, had to be answered by the map makers. Their comments indicate that an evaluation and marking system would require some special effort, but there was no firm opinion that such a system was impossible. Map evaluation on a world-wide basis is actually in progress by the Army Map Service and the principal problem would be in placing the evaluation on our enormous number of existing maps. This would undoubtedly take a good many years to accomplish.

The third question is answered by the recommended system outlined below. The criteria by which maps should be classified are a matter of current study by our map makers in the NATO Standardization Program. Such criteria, once standardized, should form the basis for any map evaluation system. However, the map user is vitally concerned with the way such criteria would be applied. The recommended system sets forth such application in accordance with the indicated requirements of the map users.

Large and medium scale military maps will be marked with a reliability notation which will include the following components:

HORIZONTAL ACCURACY. Indicated by both a descriptive and definitive (numeric) rating, the latter giving the maximum probable error (horizontally) as compared to local control.

VERTICAL ACCURACY. Indicated by both a descriptive and definitive (numeric) rating, the latter giving the maximum probable error (vertically) as compared to local control.

COMPLETENESS OF MAP DETAIL. Indicated by both a descriptive and definitive rating, the latter giving the percentage of suitable features that are correctly shown.

CURRENCY OF MAP DETAIL. Indicated by the year which reflects the date of latest comprehensive information of map detail.

CODED RATING. For reference purposes the above components of reliability will be indicated with a code of letter and numbers. A reference should also appear next to the coded rating which tells the publication describing the code and categories in technical detail.

RELIABILITY DIAGRAM. Single maps which have two or more distinct variations of reliability will be so indicated by use of a diagram and tabular presentation of the reliability components.

REFERENCE NOTES. Datum notes, specialized currency notes and such other items which affect the map reliability will be carried in the notation as reference notes.

Examples of map reliability notations appear in the cuts on this and the preceding page.

Major Alden P. Colvocoresses, *Corps of Engineers* (Lt. Col., USAR), was commissioned from the University of Arizona in 1940, served through ten campaigns in ETO and two in Korea with Eighth Army. After a tour at Fort Belvoir, he is now taking advanced studies in engineering at Ohio State University.

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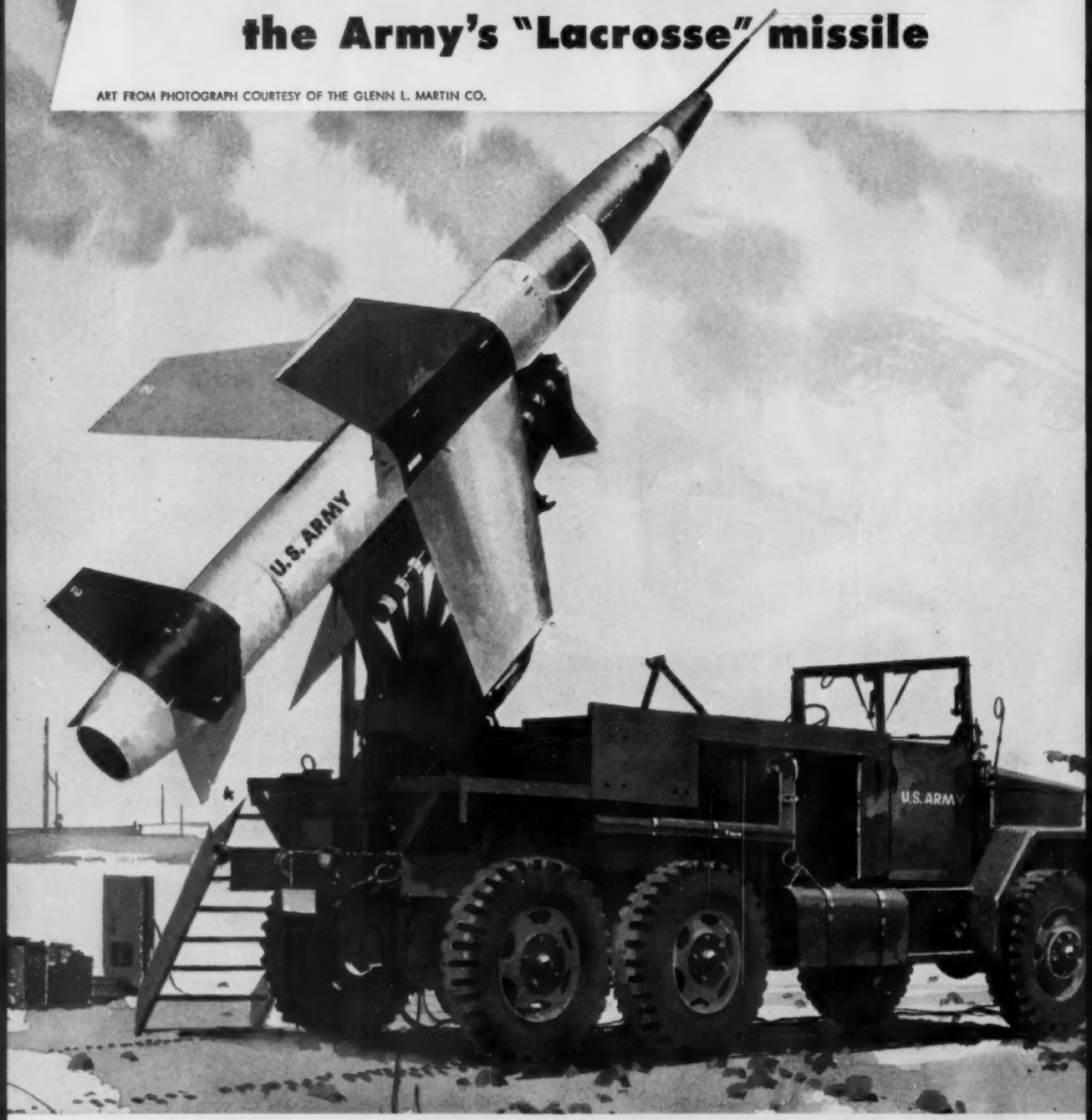

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CATERER TO REDSTONE

The Army's new mobile LOX plant solves a difficult logistic problem

JAMES C. V. D. BROWN

The Redstone missile being fueled with liquid oxygen from a special tank truck.

A major logistics barrier to the full use of the Redstone missile in the field has been removed. The Corps of Engineers has developed a highly-compact, portable, liquid oxygen (LOX) plant, which can travel with the missile into the battle areas and manufacture up to twenty tons of LOX per day at or near the missile's launching site. The plant, mounted on four large tractor-drawn vans, is the pilot model of eleven being manufactured for the Corps of Engineers by Air Products, Inc., at a cost of approximately $1,000,000 each.

The Army's entrance into cryogenics (the field of low temperatures) marks another step forward in the application of science to the battlefield, for combat soldiers will soon be working with extreme low-temperature products and processes which heretofore have been the exclusive domain of highly trained scientists and engineers.

Liquid oxygen is a fantastically cold light-blue liquid a trifle heavier than water. In missile work it is produced and handled at a temperature of about 297 degrees below zero. It is used in Redstone as an oxidizer, a combustion agent for the fuel, ethyl alcohol, because the missile travels at extreme altitudes where there is virtually no air to be scooped up the way jet planes do at lower altitudes. Oxygen, of course, is the most effective oxidizer, and liquid oxygen has many advantages over gaseous oxygen for missile purposes. It is 600 to 800 times as concentrated; it is not under pressure and does not need heavy metal containers; and with a few simple safety precautions, it is stable and relatively easy to handle, although it packs an amount of releasable energy comparable to that of TNT.

Due to the extremely low temperature needed to keep LOX in its liquid state, it cannot be stored in any quantity for very long, and providing the missile in the field with LOX has been one of the foremost support problems. Yet missiles, whether in flight or standing ready, use tons of LOX daily. The new twenty-ton portable unit would seem to have solved the problem of making LOX cheaply (about

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James C. V. D. Brown, an Associate Editor of *ARMY*, served in an engineer outfit during the Second World War. He attended The George Washington University and was with the Washington bureau of *The Chicago Tribune* before joining *ARMY*'s staff.

The Army's mobile 20-ton liquid-oxygen plant in operation. Liquid oxygen is used to provide combustion of fuel in long-range missiles. In the foreground is one of two compressor units which draw in air and compress it to 100 pounds per square inch. In the unit behind, the compressed air is cooled almost to liquid state. Impurities such as water vapor and carbon dioxide are frozen out of the air stream. Photo shows these impurities being blown out by a blast of by-product nitrogen. Behind the blast can be seen the washtub-like intake of the second compressor unit. In another unit, not shown, the air is liquefied and nitrogen distilled off, leaving liquid oxygen. All units of the plant, developed by the Army's Corps of Engineers and Air Products, Inc., have a capacity approaching that of large industrial installations and can be drawn by truck-tractor units to battlefield operational sites.

two pounds of LOX for every pound of diesel fuel consumed by the compressors) and in quantity near the launching site.

The new plant is mounted on four semi-trailers, two of which bear the identical air-feed units; one, the heat exchangers; and one, the air separation equipment and control panel.

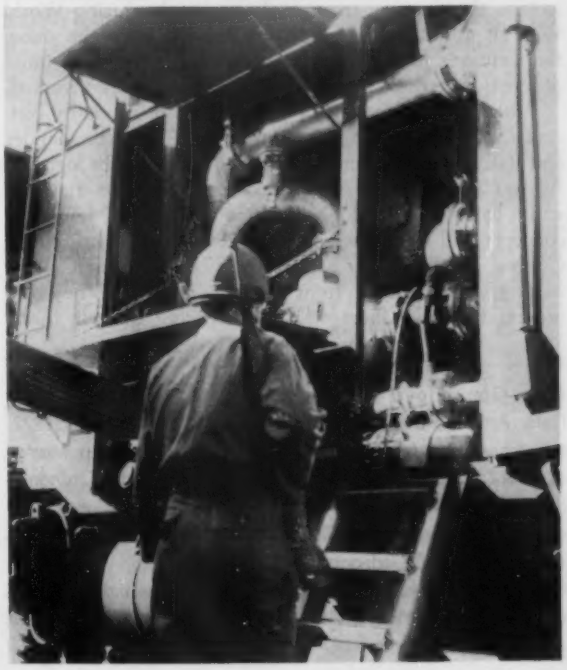
The two air-supply units each consist of a 1,200-horsepower Fairbanks-Morse opposed-piston diesel engine driving a two-stage rotary compressor which compresses air to 100 pounds per square inch. Each of these semi-trailers is 30 feet long, 8 feet wide and 11 feet 2 inches high, and weighs about 50,000 pounds.

The heat exchanger unit contains equipment for final cooling and purifying of the compressed air, which is passed through extended-surface-type aluminum heat exchangers, cooled by effluent nitrogen passed back from further stages in the process. Storage space for connecting pipe is included in this semi-trailer, the dimensions are about the same as those of the compressor trailer and the weight is 46,000 pounds.

The air separator van contains the distillation gear, the liquefier, the expansion turbine, other small equipment, and the control room. Air from the heat exchanger unit passes through the liquefier where some of it is liquefied and passes through a series of coolers and boilers to the distillation column, where the nitrogen is boiled off as a gas and the pure LOX is drawn off, subcooled, and discharged into storage tanks or tank trucks. This trailer's dimensions are also approximately the same, the weight 38,000 pounds.

The new LOX plant has been tested successfully, and Army Engineer operating crews for field deployment are training at Fort Belvoir, Va. The 580th Army Engineer Company, Redstone, first to be put into service, has already trained on earlier equipment, employing a different industrial process and capable of producing only five tons of LOX per day.

The Army Engineer School is training soldiers to operate the mobile liquid oxygen plant. This man, who is a member of an Army Engineer Company, Redstone, is watching one of the two compressors, each powered by a 1,200-horsepower diesel engine. Compressed air is led through the flexible tube at left into other units where it is liquefied, nitrogen is distilled off, and liquid oxygen is discharged.



To keep the new weapons of the combat forces in shooting shape, Ordnance Corps' field service is endeavoring to overcome many difficult logistical and maintenance problems

How Ordnance Serves the Combat Soldier

MAJOR GENERAL FLOYD A. HANSEN

THE Ordnance Corps is endeavoring to make its support of the fighting units of the new Pentomic divisions more effective, in the face of increasingly complex equipment and the difficulties imposed by new battlefield conditions.

We in the Ordnance are striving to give each staff officer and his commander the necessary tools in the form of a good system, good equipment, trained personnel and units, and the authority to exercise initiative in applying these tools as the situation requires. For example, during World War II, although the principles applied were the same, the solutions for ordnance support in Europe were quite different from those in the Pacific. Yet both systems worked.

Whether you are staff or line, the problem vitally concerns you, for you are the customer. Every commander and staff officer has a share in the responsibility for logistics. As you may have heard, "Good logistics alone may not win a battle, but bad logistics alone will lose it." Logistical concepts and decisions can't be left to the other fellow. General W. B. Palmer said at the National War College soon after returning from Korea, "It would be very unwise for any officer who is preparing himself to be a field commander, to brush over his study of the dull but decisive business of logistics, thinking that some specialist will look after it for him." We must make every effort in thinking, talking and writing to influence the concepts and decisions that will bring the most effective logistical support to the battlefield.

In studying logistical organization, much thinking has been done about the proper level of responsibility at which a commodity organization should become functional. I believe the decision on this question will greatly influence the success of our logistical support. Figure 1 shows a functional organization with commodity components. Turn the chart ninety degrees and you'll see a commodity organization with functional components.

But any way you read the chart, a high degree of coordination is required for effective operation. For decades charts like this have been turned back and forth in attempts to devise a foolproof method of coordinating the efforts of many into those of an effective, efficient team.

Industry's top management recognizes more and more that the size of a functional type of organization determines its efficiency. History shows that most large corporations began with a functional organization, but as each firm grew in personnel and production, the span of control required decentralization on a product (or commodity) basis.

Recently Harvard's Graduate School of Business Administration recommended that a commodity type of organization be adopted by our Air Force. A Command and General Staff College study supported that concept when it said: "From the foregoing [discussion of functional versus commodity type of support] it is concluded that the present technical service commodity type of logistic organization structure, utilizing technological developments and im-

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Maj. Gen. Floyd A. Hansen was commissioned in the Field Artillery after graduating from West Point in 1932, and transferred to Ordnance in 1940. He earned his Master of Science degree at MIT and is a graduate of the Ordnance School and the National War College. He was executive officer to the Ordnance Officer of First Army in ETO. He is now Assistant Chief of Ordnance (Field Service Division which deals in storage, issue and maintenance). This article is drawn from a lecture General Hansen delivered at the Army War College earlier this year.

proved operating procedures, should be retained as a basis for future logistic organizational development." It is essential that a commander, at any level, be able to control the resources he needs to accomplish his mission, and that he be able to depend on *one* man for all operations pertaining to any item such as a gun, a missile, a tank, or other piece of equipment. Furthermore, that one man must be able to provide the commander with the essential knowledge of the capabilities and limitations of that weapon or piece of equipment, how to operate it most effectively, how to repair it, know how best to get it back into the user's hands, and to determine when it should be replaced.

In Ordnance we favor the commodity type of organization, beginning at the level of chief of technical service and carrying it as far forward as size permits efficient use—in general, down to and including division.

Principle of ordnance service

So it is through this Ordnance concept that our plans for the future are based on certain principles of ordnance service which, like the principles of war, have stood the test of time and have been found sound. These are the principles:

- ¶ Single source of service for the user. For each commodity or related group of equipment we must provide a single source of supply and maintenance service.
- ¶ Indivisibility of supply and maintenance—maintenance must support supply.
- ¶ Repair parts—fast moving forward—slow moving in rear. Repair-parts stocks must be keyed to the supporting unit's needs, and never permitted to bog it down.
- ¶ Maintenance and supply at lowest logistical echelon. Support must be provided as far forward as conditions permit.

The Leavenworth study on 1965 tactics and logistics supports and emphasizes the necessity for applying these long-standing Ordnance service principles.

Organization

Certain characteristics and a philosophy of ordnance service have evolved from past applications of these eight principles:

(1) Ordnance is primarily a supply service.

(2) Ordnance maintenance service reduces to the minimum the Army's requirements for new matériel. The maintenance service must be organized and must operate to just that point where it gets maximum life from the equipment it provides. There comes a time when it is cheaper in terms of transportation and manpower demands to replace an article rather than to continue supplying parts and expending precious man-hours on repairs. The problem is to determine this balance point.

(3) Supply and maintenance are interdependent, and cannot serve effectively if they are separated (that is, "functionalized") or operated independently.

(4) Along with other logistical functions, supply and maintenance are a command responsibility running from the front-line rifleman back to the commander in chief. Any scheme that attempts to take the logistical burden off the back of the commander is as impractical as proposing to give each rifleman a caddy for his rifle and other gear so as to relieve him of *his* logistical burden. Each commander must control *all* the resources he needs to accomplish his mission; yet he must not be burdened with more than he can use.

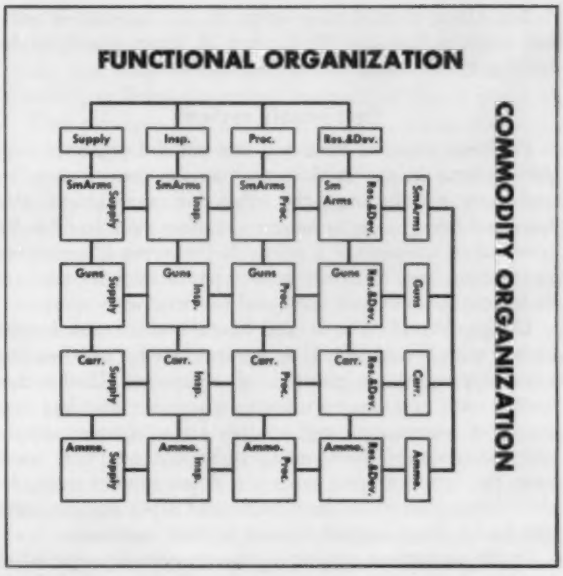

Figure 1. **As it appears here this chart shows a functional organization with commodity components. But turn it ninety degrees to your left and it shows a commodity organization with functional components. Significance? No matter which way you turn it, it won't work unless there is a high degree of coordination and a will to make it work**

(5) The aim of the echelon system of supply and maintenance is to apportion to each command level the appropriate degree of logistical responsibility and the proper amount of resources. These echelons are divided into the using (organizational) and the supporting (field and depot) categories. Generally, the so-called lower echelons do a relatively small amount of work on a relatively large number of differing articles while the "higher" echelons have considerably more work on relatively few items.

(6) Ordnance supporting units in direct contact with using units (direct support) must be mobile enough to keep up with the customer. They must provide him with a single source of supply *and* maintenance for a related (or commodity) group of major items. They must immediately replace evacuated items which cannot be repaired and returned within a reasonable time. They must maintain the impetus of service from the rear by direct exchange of selected high-mortality recoverable items without undue paperwork; anticipate supply needs by keeping up on all matters affecting the user's equipment; provide technical advice and assistance; make on-site repairs to equipment whenever practicable; and provide selective unit distribution of supplies when the situation warrants it.

(7) While direct-support units are organized and operate to aid in accomplishing the *user's* mission, supporting echelons in rear must be designed to facilitate the *technical services'* mission of supporting the user.

(8) Full advantage must be taken of the organization and communications provided by this echelonment of functions by making the greatest use of technical channels to speed support to the user.

The effect of modern weapons on the conduct of combat requires that the application of these principles be tailored to the needs of the Pentomic army.

Four supply systems

For some time we have had two parallel ordnance support systems in the field army: one for general supplies and their maintenance, the other for ammunition. We have had two systems because you cannot store and handle tremendous tonnages of a relatively few types of explosives in the same way or in the same types of facilities you use to handle thousands of small and non-explosive items.

During World War II and Korea (which was fought mainly with World War II equipment) we became familiar with this system in theaters of operations. Under this system each customer—no matter where he was—had one source of ammunition and another for equipment supply and maintenance. Reinforcing these direct-support units were the heavy support units and depot support units. In the ammunition chain these heavy and depot support units also had a direct-support mission to local customers.

In the equipment support chain we seemed to specialize in either supply or maintenance at the heavy and depot support levels. But these two activities were commanded by the same group headquarters, and the needs of the supply units dictated the work of the maintenance units.

This is a relatively clear and simple system. However, in recent years it has become muddied by the appearance of our new missiles and nuclear weapons. For many reasons—including security, technical complexity, small stocks and lack of field experience—at first we had to establish support systems outside the standard framework I have just described.

The result is that today, in contrast to two different support systems of World War II, we find ourselves with at least four parallel systems: the two old standbys plus a series of units for supply and maintenance of missiles and their related equipment, and another series for the supply and maintenance of nuclear shells and warheads with related equipment. The effect on a typical customer is shown in Figure 2. You will see that not only does the Corporal battalion have at least four different ordnance units supporting it, but that it needs two to provide a complete round of nuclear ammunition. You will agree that this is not a sound application of the principles of ordnance service.

During the past two years the Chief of Ordnance and the Commanding General, USCONARC, have been developing a revised series of ordnance field units which we think will re-implement the fundamentals of our World War II systems and at the same time recognize and adapt themselves to the realities of new battlefield conditions. These new conditions require that we disperse to a far greater degree, that mobility be swifter, and that more complex operations be moved farther to the rear.

We have designed a new class V support system that merges into one integrated chain the current separate HE, missile, and special-weapons systems. This new ammunition system was field-tested during Exercise King Cole. If studies prove it was successful, we will install it in the field beginning in fiscal year 1958.

Thus we will again have an ordnance support system that uses one source of supply for ammunition and another for general supply and maintenance. However, only the ammunition leg of this system will have been modernized. We are now streamlining our general supply and maintenance system. Some of the major differences between the present ordnance support systems and those of the future are shown in Figure 3.

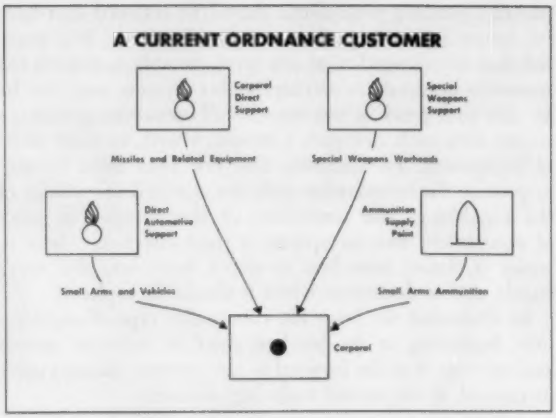

Figure 2. **Under the system shown here the Corporal battalion has four different ordnance units supporting it and requires two of them to provide a complete round of nuclear ammunition. It would be hard to defend the soundness of this system**

For comparison, I have selected four types of ordnance operations, shown in the first column: equipment rebuild, equipment and repair-parts supply, equipment direct support, and ammunition. Notice that the trend is toward moving heavier operations farther to the rear, thus operating smaller-sized units and reducing supply levels through better controls and a more responsive system.

Service troop requirements

From the foregoing you can see that we are again achieving a system of ordnance support we feel is simple, clear and practical. However, the increasing complexity of equipment and the requirement for decentralized operations will affect our service troop requirements. As General Taylor said recently at the Armed Forces Staff College, the requirements for service personnel in proportion to combat personnel are increasing. The greater effectiveness of our new weapons is not only more costly in dollars, but also in support manpower.

As an instance, the personnel requirement for direct support of the primary weapons of the Nike Ajax battalion is more than five times that of the 90mm AA gun battalion it replaces.

Obviously, this is an extreme example. The average or over-all increase is nowhere near this magnitude. Using a type corps force as a basis for comparison, the percentage of ordnance troops in a theater of operations behind the divisions of one corps was 4.2 in 1945 and 5.0 in 1955, and is estimated at 5.7 for 1960 and 6.5 in 1965.

We must find more efficient ways of doing our supply job if we are to offset the effects of increasing complexity and decentralization. While progress in technology has provided more complex equipment, it has also given us improved tools. This, coupled with improved administrative practices, enables us to provide more economical, more efficient, and speedier service with less use of time, labor,

and other resources. Two examples are the Army Field Stock Control System and Project MASS.

AFSCS

The Army Field Stock Control System resulted from Ordnance studies after World War II which showed that too frequently ordnance support units were unable to supply fast-moving parts. Yet these units were overburdened with huge stocks of slower-moving items. Four basic reasons for this were determined:

Accounting procedures were not designed for operating in combat; records literally couldn't be kept.

Requisitioning and shipping procedures and documentation were inadequate. It took too long for the order to reach the source of supply, and shipments frequently went astray.

Supply catalogs were too complex for field use. People couldn't identify what they needed.

Allowances were not related to actual consumption experience; yet many outfits kept on ordering what the book said.

Using these findings as a basis for further study, the Ordnance Board devised a field supply system suited for peacetime operations but capable of being easily converted to the requirements of a large-scale war.

Realizing that economic stock distribution depends upon effective control, the Board concentrated first on field procedures. It aimed at turning out a supply system which incorporated all the basic elements of supply control that would be run by less experienced supply people under combat pressure. It came up with the Army Field Stock Control System, with its key contributions to supply improvement of a selective stockage plan, an improved stock record system, and the establishment of realistic consumption-demand rates.

The selective stockage plan makes it possible for each supply point to select those items that must be stocked to give optimum support capability. Combat experience proves that fifteen per cent of repair parts satisfies approximately eighty-five per cent of demand. The plan eliminates dead stocks that only clutter shelves and make for immobility, resulting in better control of the needed fifteen per cent.

The principle can be stated simply: select and stock fast-moving parts forward, slower-moving parts to the rear. The end product is a theater or army unit stockage list. Implemented in Korea, the plan proved that inventories could be greatly reduced, thus effecting economies in costs, storage and maintenance.

Using the improved stock record, an inexperienced man can keep an accurate record of his stocks that automatically warns him of actions he may not foresee: order more, delete this item, substitute that one, and so on. At the same time, his supply actions warn back-up echelons of the need for timely corrections.

The establishment of a realistic consumption-demand rate is a by-product of this improved stock record. The rate at which any item is consumed is the most important element to which any supply business is geared. This rate is the basis for forecasting procurement and distribution. The importance of accurately establishing this rate can be understood when you consider that under the best possible conditions, this forecast covers a lead time of from ten to twenty-five months. We must get data back fast, establish their accuracy, put them to use.

The Army Field Stock Control System provides the answer. It enables us to establish controlled stockage lists and to base further tests of logistical systems on this sound ground. One such test is Project Mass, which went into test on 1 July 1956.

***Figure 3.* How ordnance support systems are being streamlined**

OPERATION	PAST & PRESENT	FUTURE
EQUIPMENT REBUILD	COMZ battalion size units in large fixed installations. Complete end-item rebuild.	Primarily ZI. Limited rebuild of critical components in COMZ in company sized semi-mobile units.
EQUIPMENT & REPAIR PARTS SUPPLY	Issued to the user through supporting maintenance unit.	No change in system, but a reduction in levels of supply through better controls.
EQUIPMENT DIRECT SUPPORT	Different TOEs to perform same mission in COMZ and Field Army. Company size shop area.	Same TOEs to perform same mission in COMZ and Field Army. Platoon size shops, truck mounted.
AMMUNITION	Three separate systems, HE, MSLs & SW. Small number of specialized installations.	One integrated system, HE, MSLs & SW. Large number of small general installations.

Ordnance is with you

The only reason the Ordnance Corps exists is to serve the line. Success in this service can be fully realized only through the teamwork of a progressive Ordnance Corps and a logistically intelligent user. Future senior commanders are becoming more familiar with their parts in the task. Ordnance, using proven supply principles, develops organizations, techniques and applications which will progressively meet the requirements of the modern field army and its commanders, all the way down the line.

Rapid advances in technology and other scientific fields have produced more complex weapons that require greater specialized knowledge on the part of the user and the servicer. At the same time, this scientific progress helps develop more advanced tools that we can use to provide improved service with less consumption of scarce resources of personnel, time and matériel.

In the past, many commanders credited the same formula for victory. General Taylor recently repeated it: Victory will inevitably depend upon the effective utilization of "personnel plus fire power plus mobility." Fire power and mobility are provided by Ordnance, which knows the capabilities and limitations of its products. The Chief of Ordnance is responsible for their design, research and development, production, storage, issue and maintenance. Trained Ordnance personnel are available to service you —the user. Ordnance recognizes that its mission is to support you in achieving that essential, effective combination of personnel, fire power and mobility that is needed for victory. The user can count upon progress in ordnance logistical support that will at least keep pace with that made in other fields of modern military operations.

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Aims and Objectives

The Association of the U. S. Army shall be an organization wherein all who are in accord with its objectives may join in the exchange of ideas and information on military matters, and in fostering, supporting, and advocating the legitimate and proper role of the Army of the United States and of all its elements, branches, and components and providing for and assuring the Nation's military security.

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General Membership. General Membership in the Association shall be open to any individual who has been honorably discharged or retired from the Armed Forces of the United States, to members of the National Guard of the United States not on active duty, to members of the United States Army Reserve not on active duty, and to such persons as have held appointive office in the Department of the Army.

Service Membership. Service Membership in the Association shall be open to all active-duty members of the Army of the United States.

Cadet Membership. Cadet membership in the Association shall be open to the cadets of the United States Military Academy and to all current enrollees in Junior, Military Schools, and Senior Divisions of the Army ROTC Program, including those units provided for by Section 55c of the National Defense Act as amended.

Associate Membership. Associate Membership shall be open to active-duty personnel of the other services, to civilian employees of the Department of the Army not qualified for General Membership, and to any individual who supports the objectives of the Association and who meets such requirements as may be promulgated in regulations passed by the Council of Trustees.

Sustaining Membership. Sustaining membership shall be open to such industrial, commercial, business, professional, technical and veteran firms, corporations, organizations or societies that wish to support the aims and purposes of the Association, subject to specific approval by the Council of Trustees.

REPORT FROM YOUR AUSA CP

The Association held its third industrial symposium (Communications and Electronics) during 18-20 September at Tucson, Arizona, with a "field" trip to the U. S. Army Electronics Proving Ground at Fort Huachuca for an outstanding demonstration. More than 450 industrial leaders and Department of the Army personnel gathered for the discussions of current problems in communications and electronics. This symposium was enthusiastically received by both industry and the Department of the Army. All of them have served to carry the Army story to influential people in Industry.

As of 1 October thirty-six industrial firms have applied for sustaining membership in the Association.

CONARC has ruled that Reserve Officers attending the Annual Meeting of the Association will be granted retirement point credits because of the high professional value of the program.

The Association's regional organization program has shown great gains since the first four Chapters and two ROTC Companies were chartered at the 1956 Annual Meeting. We now have forty-six chapters and twenty-six companies, with another fifteen chapters and eight companies at various stages of organization preparatory to charter. These regional units have engaged in a wide variety of activities of assistance to the Army, ranging from Letters to the Editor on current military problems through Field Days on Army posts where the military and civilians from surrounding areas have met and found common ground for mutual cooperation, to series of lectures to explain current Army problems. ROTC Companies have made field trips to Army installations, sponsored campus activities to develop interest in the ROTC program, and have imported speakers to address campus-wide meetings on defense subjects.

The Annual Meeting for 1957 will conclude the first full year of regional activities. Much progress has been made in organization. It is expected that the second year will bring more specific results through the chapters' strong influence on the local scene.

A Nominating Committee from the Advisory Board of Directors will select nominees for vacancies which will occur in the Board in June 1958. Suggested nominees (name, address and position) should be mailed to the Chairman of the Committee at National Headquarters.

WALTER L. WEIBLE
Lt. Gen., USA, Rtd.
Executive Vice President

AUSA REGIONAL ACTIVITIES

CHAPTERS

BROOKLYN CHAPTER—*Secretary:* Miss Irene De Martini, Office of the CG, U. S. Army Transportation Terminal Command, Atlantic, Brooklyn 50, New York. *President:* Maj. Gen. Evan M. Houseman; *First Vice President:* Brig. Gen. A. M. Willing; *Second Vice President:* Dr. Leo A. Lieberman; *Treasurer:* Mr. Bernard Hershey.

At meeting 5 September, voted to merge with New York Chapter.

THE CHICAGO AREA CHAPTER—Room 226, 666 Lake Shore Drive, Chicago 11, Illinois. *President:* Gen. Robert E. Wood, USA-Rtd.; *First Vice President:* Brig. Gen. Lawrence Whiting, USAR-Rtd.; *Second Vice President:* Brig. Gen. Otto Kerner, USAR-Rtd.; *Third Vice President:* Col. Walter L. Furbershaw, USAR-Rtd.; *Fourth Vice President:* Col. Joseph Triner; *Secretary:* Col. Jules V. Houghtaling, USAR-Rtd.; *Treasurer:* Lt. Col. O. C. Tyler, USAR; *Asst. Secretary:* Lt. Col. Herbert Moselle, USAR.

Name changed from Cook County Chapter to indicate expanded aims and coverage.

DIX CHAPTER—*Secretary:* MSgt J. Holland, Hq U. S. Army Training Center, Infantry, Fort Dix, New Jersey. *President:* Col. G. C. Jones; *First Vice President:* Col. R. W. Reed; *Second Vice President:* MSgt J. J. Corcoran; *Treasurer:* Capt. W. J. Jenkins.

Lt. Gen. Milton G. Baker, PaNG, Rtd, Superintendent of Valley Forge Military Academy and member of the Council of Trustees, AUSA, presented Charter formally to the Dix Chapter 3 October. The audience included more than 1,000 officers and NCOs.

EL PASO CHAPTER—*Secretary:* Mr. C. William Wakefield, P.O. Box 193, El Paso, Tex. *President:* Dr. Hervey W. Dietrich; *First Vice President:* Mr. Richard W. MacCarthy; *Second Vice President:* Mr. L. T. Vice; *Treasurer:* Mr. George E. Rawson.

Chapter had conducted tour of Guided Missiles Department of AA Defense School 16 September. One member wrote National AUSA: "We're all better Americans as a result." Earlier, on 24 August, Chapter saw four Nike Ajax missiles fired.

ELEVENTH AIRBORNE DIVISION CHAPTER—*President:* Colonel A. R. Taylor, Hq & Hq Co., Comd, and Con Bn, Hq 11th Airborne Division, APO 112, New York, N. Y. *Honorary President:* Maj. Gen. Hugh P. Harris; *First Vice President:* Lt. Col. Charles J. Parziale; *Second Vice President:* Capt. Karl R. Morton; *Secretary:* MSgt Russell A. Steinkuehler; *Treasurer:* Capt. George A. Peters.

Geographical area: Munich and Augsburg, Germany, and immediately surrounding areas. Assigned and attached units of the 11th Airborne Division are located within this geographical area (APOs 29 and 112, N. Y.).

Chapter is sending an outstanding NCO representative to attend AUSA's Annual Meeting. Plans are being made to sponsor a trophy for units of the division for outstanding performance.

GENERAL JOHN J. PERSHING CHAPTER—*Treasurer:* Lt. Col. Harland Dodge, c/o Comptroller Section, Hq First U. S. Army, Governors Island, New York. *President:* Col. Sidney G. Brown, Jr.; *First Vice President:* Col. Harry C. Keeney; *Second Vice President:* MSgt John A. Butler; *Secretary:* Major George I. Stoeckert; *Legal Officer:* 1st Lieutenant Sheldon Cohen.

Considering merger with New York Chapter for more efficient coverage of the Metropolitan area.

HEADQUARTERS SEVENTH U. S. ARMY CHAPTER—c/o Secy of the General Staff, Headquarters, Seventh U. S. Army, APO 46, New York.

SAN FRANCISCO. Col. C. W. Allan, Deputy Chief of Staff, Sixth Army, speaks at annual dinner of the San Francisco Chapter, AUSA. At his left are Mrs. Albert Leslie and Lt. Gen. C. B. Ferenbaugh, USA, Rtd.

OKLAHOMA CITY, OKLA. Officers of the newly organized Oklahoma City Chapter at its inaugural meeting, held 27 September 1957, with an attendance of about 150 persons. *Left to right are:* Col. Charles E. Tompkins, President; Brig. Gen. Paul B. Bell, First Vice President; Col. John W. Long, Second Vice President; Col. Luzerne M. Tidd, Treasurer; First Lt. Ruth Ann Love, Secretary.

OAKLAND, CALIF. Opening an enrollment of outstanding business and civic leaders by the East Bay Chapter of AUSA, The Hon. George P. Miller, Representative in Congress of California's 8th District, signs up as a member. With him, *left to right*, are Maj. Gen. William F. Dean, USA, Rtd., First Vice President; Edwin Meese, Jr., President; and Col. Earl W. Huntting, USAR, Secretary.

N. Y. *President:* Brig. Gen. James K. Wilson; *First Vice President:* Col. Donald M. McClain; *Second Vice President:* Col. James Taylor, Jr., *Secretary:* Major Young O. Kim; *Treasurer:* Lt. Colonel Dan P. Briggs.

First formal chapter meeting held 6 September at Patch Barracks. Gen. Charles L. Bolté, member of Council of Trustees of AUSA, was principal speaker; Gen. Bruce Clarke made some supplementary remarks. Officers listed above were elected at the same meeting. General Wilson, as his first official act as president, appointed General Clarke Honorary President of the Chapter.

General Bolté stressed that AUSA does not compete with other associations, but complements them, and paid tribute to "the man in the brown suit" who fights our wars, and particularly the forward observer, medic, tanker or infantryman who slugs it out on the front line. "Most of the sweat and blood are his and the tears those of his family," General Bolté said.

INDIANA CHAPTER—711 N. Pennsylvania St., Indianapolis, Indiana. *President:* Maj. Gen. Emmett J. Bean, Rtd.; *First Vice President:* Brig. Gen. John W. McConnell; *Second Vice President:* Colonel James O. Freese; *Secretary:* Major Jack K. Elrod; *Treasurer:* Major Walter J. Schuchmann.

POLK CHAPTER—*Secretary:* Maj. LeRoy Conklin, Fort Polk, La. *President:* Mr. F. E. Hernandez; *First Vice President:* Mr. F. H. Coughlin; *Second Vice President:* Mr. Euclid Morris; *Treasurer:* Mr. Keith Pigott.

SAN BERNARDINO COUNTY CHAPTER—c/o Lt. Col. David D. Fleming, Board of Governors, Camp Irwin, California. *President:* Mr. George W. Savage; *First Vice President:* Mr. Victor J. Smith; *Second Vice President:* Lt. Col. Christian E. Petersen, AUS-Rtd.; *Secretary:* MSgt Alfred Schmidt; *Treasurer:* SFC Gerald Morgan.

SAN FRANCISCO CHAPTER—*Secretary:* Col. C. C. W. Allan, Office of the Deputy Chief of Staff, Hq Sixth U. S. Army, Presidio of San Francisco, California. *President:* Mr. Frederick M. Fisk; *First Vice President:* Lt. Gen. Claude B. Ferenbaugh, USA-Rtd.; *Second Vice President:* Mr. William M. McNabb; *Treasurer:* Mr. Albert Leslie.

Dinner meeting 19 September viewed 3-D color slides and heard Mr. Ted Huggins discuss Germany and the U. S. Army units there.

SEATTLE CHAPTER—The Officers' Open Mess, Fort Lawton, Washington. *President:* Mr. Arthur T. Lee; *First Vice President:* Mr. Joseph A. Sweeney; *Second Vice President:* Brig. Gen. Harold L. Goss, USAR-Rtd.; *Secretary:* Col. Garnett H. Wilson, USA-Rtd.; *Treasurer:* Mr. Paul Danforth.

SOUTHERN ARIZONA CHAPTER—*President pro tem:* Mr. F. W. Boyd Allen, Alumni Association, University of Arizona, Tucson, Arizona; *Treasurer pro tem:* Mr. Robert W. Heyer.

Geographic area: The following counties of Southern Arizona: Cochise, Graham, Greenlee, Pima, Pinal, Santa Cruz, Yuma, and that portion of Maricopa lying South and East of the Gila River. The boundaries submitted for the Chapter area are subject to later adjustment as required for more efficient coverage of the State of Arizona as determined by National Headquarters and at such time as other Chapters in Arizona are formed.

Charter chartered during AUSA's electronic symposium at Tucson, on 19 September. General Bolté and Mr. Belding, members of AUSA's Council of Trustees, presented the charter at the Symposium Banquet.

WESTCHESTER COUNTY CHAPTER—*Secretary-Treasurer:* Mr. Harold Greene, 48 Ronny Circle, Hastings-on-Hudson, N. Y. *President:* Col. L. N. Cron; *First Vice President:* Chap. (Col.) James T. Wilson; *Second Vice President:* Mr. John Leykam.

Meeting 30 September elected new officers listed above. Chapter has been well publicized in local news media.

COLORADO SPRINGS, COLO. Accompanied by members of Pikes Peak Chapter, Trotter, famous Army mule, makes ready for his trip to West Point, where he was presented to the Corps of Cadets during the Army-Nebraska Game. He was purchased by the Pikes Peak Or Bust Rodeo Association when the 40th FA was inactivated.

ROTC COMPANIES

DAKOTA COMPANY, North Dakota Agricultural College, Fargo, N. D.—*Captain:* Cadet Arnold Ellingson; *First Lieutenant:* Cadet Neal R. Bjornson; *Second Lieutenant:* Cadet Melvin G. Werth; *Social Chairman:* Cadet Curtis L. Stromstad; *First Sergeant:* Cadet W. Dale Ruff.

First meeting of the school year was held 26 September. The new third-year cadets were invited to attend, and were told of AUSA and Dakota Company's purposes and programs by Cadet Ellingson, Captain of Dakota Company, and by Captain Sennewald, Assistant PMST and Faculty Adviser. Plans were laid to participate in campus events during the coming school year. A film on the 1952 Olympics was shown, and the evening ended with coffee and cookies.

ILLINI COMPANY, University of Illinois, Champaign, Illinois—*Captain:* Cadet Armand Ferrini; *First Lieutenant:* Cadet Kenneth Weber; *Second Lieutenant:* Cadet Charles W. Thompson; *First Sergeant:* Cadet Ray L. Allison.

Col. John Slezak, National President of AUSA, presented the charter to the Company at a banquet held 8 October.

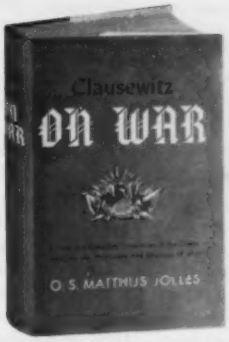
JOHN CARROLL UNIVERSITY COMPANY, John Carroll University, Cleveland 18, Ohio—*Captain:* Cadet George W. Makra; *First Lieutenant:* Cadet Jerry Porter; *Second Lieutenant:* Cadet Robert Seiler; *First Sergeant:* Cadet Roger Hurley.

SIENA ROTC COMPANY, St. Bernardine of Siena College, Loudonville, New York—*Captain:* Cadet Paul R. Riley, Jr.; *First Lieutenant:* Cadet John W. Stahlman; *Second Lieutenant:* Cadet Louis R. La Gasse; *First Sergeant:* Cadet J. Vincent Chesterfield.

Meeting 25 September decided that AUSA Company members would wear fourrageres. Plans made for stag dinner in October, Military Ball 6 December, and tour of Watervliet Arsenal.

ALBUQUERQUE, N. M. Among those attending the dinner at the fall meeting of Albuquerque Chapter were, *left to right,* Maj. Gen. Kenner F. Hertford, USA, Rtd., Manager, Albuquerque Office, Atomic Energy Commission; Maj. Gen. Louis T. Heath, CG, Field Command, AFSWP, Sandia Base; Col. Frederick W. Hasselback, Sandia Base, who spoke of the past, present and future of the U. S. Army; and Col. Benjamin T. Rogers, USA, Rtd., President of Albuquerque Chapter.

Clausewitz . . .



ON WAR

TRANSLATED BY
O. S. MATTHIJS JOLLES

No military student is educated, no officer is competent for higher command or staff duties, until he has read and re-read *On War.*

Tactics change, often from year to year; strategic concepts must be redeveloped in light of new weapons and defenses against them. But the meaning and the purposes of war are unchanged and unchanging.

Clausewitz's clear, penetrating comments on the nature and conduct of war are as vital now as they were in his own time, and as they will be a century from now. His thinking and his logic have influenced every war fought in the 20th Century.

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THE MONTH'S BOOKS

Snafued Sea Lion

OPERATION SEA LION
By Peter Fleming
Simon & Schuster, 1957
323 Pages; Illustrated; Index; $5.00

Reviewed by
COL. S. LEGREE

The Superman myth might have died much sooner if the facts about Hitler's snafued plans for the invasion of Britain had become known earlier. It could have been difficult to take seriously a military staff that attempted to mount an amphibious invasion with such half-hearted and poorly planned measures. A thorough reading of this literate and thoughtful work cannot help but increase our respect for our own amphibious planners.

Not that the British themselves had a clear picture of what faced them. It is a toss-up as to whether the British or the Germans would have made more mistakes, but by the nature of things the German mistakes would have been more costly. Hitler was wiser than he knew in permitting the invasion to be called off.

A battalion commander of Territorials (corresponds to our National Guard) after the war, a war correspondent in Manchuria and China, and a serving officer in Norway, Greece and Burma as well as in England during the invasion scare, the author has the background to tell the story in a clear and witty manner. He is at his best in describing Goering's boasts, Churchill's fortunate egotism, and the weird unrealism that marked the preparations on both sides.

Mr. Fleming disposes completely of some of the legends, such as the destruction of German landing barges, the washing ashore of hundreds of burned bodies of Germans, and the British ability to set the sea afire. Good stories, but just not true.

Among the Nation's Builders

ROADS, RAILS AND WATERWAYS
By Forest G. Hill
University of Oklahoma Press, 1957
248 Pages; Illustrated; Index; $4.00

Reviewed by
COLONEL S. LEGREE

In these days when MIT, Carnegie Tech, Cal Tech and scores of other top-flight engineering schools cannot keep up with the demand, it is a bit difficult to realize that in the early part of the nineteenth century West Point was the only engineering school in the United States. A note of the times, worthy of consideration at this period of Army fortunes, is the statement made by Secretary of War William Wilkins in 1844 that it was proper to encourage resignations from the Army to accept engineering jobs because graduates of the Military Academy were useful in private as well as in public life. It is well to remember that Karl Marx was but twenty-six at the time, and Congreve's rockets had been considerably less than successful.

Professor Hill presents a very good case that our country's expansion would have been slowed tremendously if the West Point-trained engineers had not been available for mapping, and the building of railroads, roads and waterways. Engineers were scarce, and since West Point trained them the Corps of Engineers used their talents for the benefit of the entire country. Under the direction of the Engineer Department, which included the Topographical Engineers as well as the Corps of Engineers (both branches were merged during the Civil War), the Academy-trained men served as the nation's department of public works at a time when their bold imagination and peerless skill permitted the extension of our economic boundaries. Those who went into private industry proved, in the main, to be capable managers of commercial enterprise. They were available, when needed, to fight in the Civil War.

The book is short, scholarly, and factual. These three qualities are at once the strength and weaknesses of the work; it merely whets the appetite, it is unnecessarily dull, and expresses none of the color of a vivid period in the country's expansion.

Helpful Guide by a Layman

MILITARY TRIAL TECHNIQUES
By Major James L. Spratt
American Guild Press, 1957
322 Pages; $4.98

Reviewed by
COL. FREDERICK BERNAYS WIENER, *JAGC, USAR, who has contributed many articles and reviews to* ARMY.

Unless prosecuted by a lawyer, when defense counsel must be similarly qualified, all trials by special courts-martial under the Uniform Code still fall to lay officers to try, and in this volume the author—himself a layman—draws on his extensive military law experience to offer helpful suggestions to those who may be detailed as counsel in special-court cases.

To say that a better job than this book is could have been done, textually and otherwise, is not to minimize the value of what is here presented. For too often, as current records of trial by general courts-martial bear witness, the JA who is duly certified as qualified to prosecute or defend cases is not really qualified in fact; he makes needless errors; he plainly has not grasped the essentials of the rules of evidence; and he too often does not know how—or when—to cross-examine. Many JAs now appearing before general courts would profit measurably from study of this book.

Indeed, the observer may well ask himself whether, in fact, either the quality or the objective of GCM military justice has been improved by the total elimination of lay counsel, and by their replacement by lawyers who—speak it softly—are demonstrably not in every instance the cream of the crop. Certainly the accused who is not plainly and overwhelmingly guilty would be better served by the lay author of the present book than by many of the duly certified lawyers, some of field grade, whose performances are scattered at large through the records of trial that now wend their way through the appellate machinery of the UCMJ.

Civil War Quartet

JEB STUART: The Last Cavalier
By Burke Davis
Rinehart & Company, 1957
462 Pages; Illustrated; Maps; Index; $6.00

THE TWENTIETH MAINE
By John J. Pullen
J. B. Lippincott Company, 1957
338 Pages; Illustrated; Maps; Index; $5.00

THE ROAD TO RICHMOND
Edited by Harold Adams Small
University of California Press, 1957
260 Pages; $1.50

THE REBEL SHORE
By James M. Merrill
Little, Brown & Company, 1957
246 Pages; Illustrated; Maps; Index; $4.75

Reviewed by
N. J. ANTHONY, *an associate editor of* ARMY, *who has done some research on the Civil War.*

Burke Davis, biographer of Lee and Jackson, in this new life of the Confederacy's most colorful cavalry leader, does a fine job of historical reporting. Through its pages the reader fairly rides and camps in the midst of Lee's Cavalry Corps; alongside the ubiquitous Stuart you never lose sight of his bristling beard, massive saber, and high boots as he jolts

along. Now and then Jeb bursts into song, booms a greeting to a passing comrade, or joshes some member of his staff. This book shows the really human side of Stuart. There are many intimate glimpses of the family man—too many, probably, to be recorded in a military biography—as well as incidents concerning subordinates like Fitzhugh Lee and Rooney Lee, John Pelham, Von Borcke, Farley, and Henry McClellan. As succeeding actions unfold, they can be easily followed on excellent maps. However, one wishes the text had gone a little deeper into Stuart's training methods and tactics, along with fuller after-action discussions. For example, why did Stuart interpret as he did Lee's order for the ride around the Army of the Potomac before Gettysburg? That remains not fully answered, although this biography contains much new material from letters, dispatches and reminiscences, such as a hitherto unpublished conversation between Lee and Stuart when they met at Gettysburg. But despite these minor criticisms, Davis's biography is a sparkling addition to the Civil War classics.

The Twentieth Maine is the story of a Volunteer regiment that was not unlike the hundreds of others that fought in the Civil War. It was first commanded by Adelbert Ames and then by Joshua L. Chamberlain, who passed out of it to take a brigade and who took the surrender at Appomattox, where he witnessed that "awed stillness." The 20th Maine's battle life began at Fredericksburg and ended at Appomattox; but its name and fame will ever be associated with Gettysburg, for this was one of the units that Warren hurriedly pulled out of position to defend Little Round Top. There it was the extreme of the Union left. It stopped successive Confederate attacks cold, at a cost of 130 casualties (included 40 killed or mortally wounded) out of a regimental battle strength of 358 muskets.

The style of writing in this book can be described in one word: superb. Mr. Pullen makes a fighting regiment live again almost a hundred years after it was inactivated, in another demonstration that military history can be made attractive by the use of popular language. The author, backed by World War II experience as an artillery officer in the 65th and 9th Infantry Divisions, has the good sense to use terminology easily understood today. In one paragraph you will find terms like "weapons were sited," "plunging fire," "interlocking bands of fire," "field artillery survey." Excellent maps are provided.

Curiously, the story of another Maine regiment appears simultaneously with that of the 20th, though this one is seen through the eyes of a member. *The Road to Richmond* is the memoirs of Abner R. Small, who enlisted in the 3d Maine and fought with it under Oliver O. Howard at Bull Run. Small was commissioned, became adjutant of the 16th Maine, and wound up as a major. He fought at Fredericksburg, Chancellorsville and Gettysburg, and was captured in the Wilderness during August 1864. The policy of exchange having been abandoned, he finished out the war in POW camps at Libby, Salisbury and Danville.

This pocket-sized paper-cover, first published in 1939, is a thoroughly human document. Small's comments on the personalities and actions of his superiors bring forth belly laughs, but there is much of the serious in his narrative. Through it we look back a hundred years and share the exhilaration of a young man going off on the Great Adventure and his disillusionment at discovering that war is a very dirty business at the foxhole level. We experience the humor and discomfort of camp life, the fears and privations that were the lot of the Civil War soldier. His chapters on prison life illustrate how inhuman man can be to his fellows. Major Small's final chapter describes in caustic terms his impressions of bravery and courage, danger and death, defeat and loyalty, sickness and goldbricking, drill and griping, weapons and rations—and war correspondents—that were all in the life of the soldier of his day. Unfortunately, there are no maps.

The Rebel Shore is a fast-moving account of the application of sea power by the Union along the Atlantic and Gulf Coasts, that ended with the closing of the port of Wilmington, North Carolina. Secretary Welles's Navy in the beginning was sent out to trade punches with shore batteries with a collection of ferry boats, passenger ships, whalers, yachts, tugs, coal barges, fishing smacks, garbage scows and rowboats. Professor Merrill rightly points the finger at myopic Army, Navy and civilian officers who would not be convinced that the loss of its ports would strangle the Confederacy. That the Confederates early realized this is attested by their stout defense of coastal areas, and by the fact that between 1861 and 1865 more than two thousand attempts were made to sneak through the blockade off the Carolinas. There is much interesting material too on the development of monitors, ironclad rams, underwater mines, and the Confederate submarines.

Tied into the story is the Army's part in amphibious operations under Burnside, Butler, Thomas W. Sherman and others, and the efforts by the Confederate generals to hold coast defenses most of which were inadequate and some downright ludicrous. The trouble on the Union side was that usually the Navy had one plan, the Army another.

This is a well-rounded tale. While not all the material is new, this work is an interesting study of naval and amphibious operations, and the dangers of operating under a divided command system.

Germany in Transition

THE UNQUIET GERMANS
By Charles W. Thayer
Harper & Brothers, 1957
275 Pages; Index; $4.00

THE UNITED STATES IN GERMANY: 1944-1955
By Harold Zink
D. Van Nostrand Company, 1957
374 Pages; Illustrated; Maps; Index; $7.50

Reviewed by
COL. CHARLES A. H. THOMSON, Infantry, *USAR, former member of AUSA's Executive Council, who is on the staff of the Brookings Institution.*

Charles W. Thayer, writer, former Foreign Service officer and one-time *Land* Commissioner for Bavaria, and Harold Zink, political scientist and former chief historian for HICOG, have written books about the same people in the same place, pursuing the same tasks of reform, reconstruction, seeking personal and international objectives. These books differ enormously in outlook and treatment. Yet the two reinforce each other. Thayer is more concerned with the Germans themselves, dealing with the impact of American occupation chiefly as it affects them. He looks behind at suggestive points in German history, and ahead to the doubtful future for a resurgent Germany. But Zink is chiefly concerned with the technical problems of an occupying force. His history gives some glimpses into the tribulations of the Ger-

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HEROES BEHIND BARBED WIRE

by Kenneth K. Hansen,
Colonel, USA, former Chief of Psychological Warfare, Far East Command

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man Country Unit of SHAEF, overlooked and little supported, in its 1944 planning that tried to bridge the gaps between a sensible occupation policy and the rigors of the vengeful White-Morgenthau plan. (More generally, Zink traces threads of preparation, training and planning in the War Department through into application on the ground in Germany.)

Thayer uses the light fencing equipment of a skillful, nimble-witted Foreign Service officer, who has learned about the game and its fine points from previous service in Germany—and service in the USSR that informed him about the strategy and tactics of a main adversary. Zink brings up the broadswords and battle-axes of cautious scholarship. He relies on his own experiences as a military historian and on the detailed work of the military historians, who wrote monographs for the Historical Division of HICOG. Zink's subject was to present an over-all account of the American role in the occupation of Germany for the use of general readers and of university students.

Thayer starts fast. He moves through the differences in view that animated Russian, Britain and American in the European Advisory Commission to the actual impact of military government as Allied armies rolled into the Fatherland. On the way he deals acutely with some of the myths and foibles of occupation: the emotional grounds for denazification and non-fraternization; the uncritical efforts to substitute American models for tried and established German practices (in civil service and education, for example). As shown in the resurgence of the German fraternity, complete with dueling and scars, tradition wins out over reform.

But it is not quite so simple as that. Many in the new Germany sought reforms but, like Minister President Erhard of Bavaria, wondered whether anyone, least of all a foreign military government, could change habits and traditions of a people with a history as long as that of the Germans. "The best you could have done," Erhard told Thayer, "was to set an example—and possibly make a few suggestions. The rest we must do for ourselves."

The full record, outlined if not exhaustively filled in by Zink, is testimony to American unbelief in that wise counsel. For the rest of Thayer is a dashing account of how German forces for tradition and for internal change have taken their own way, with little heed for policies of denazification, decartelization, deconcentration, the emancipation of women, and the like. (Dismantling did make a difference.) Tradition remains important, as shown by the sketch of village life in Ruhpolding, true to 1,500 years of history. Change shows up not only in economic practice and technology, but in such political practices as the application of lobbying to German government.

What of the future? Thayer attempts far more of an answer than Zink, but his counsel is suggestive and tentative. He notes (at second hand) conditions in East Germany where, if youth were to revolt, it would be far harder for the West to stay aloof than it was in Hungary. Although many in West Germany are reconciled to the loss in the East, there is a hard core of irreconciled. Their numbers would grow, and their claim is backed by nearly a thousand years of history. German remilitarization, dealt with at some length, raises again the possibility of an army becoming a state within a state. Whether this can be avoided depends not on the new training regulations, "but in the political maturity of Parliament, of its deputies and, in the final analysis, of its voters." As for reunification, this may cause such acute frustration as to drive Germans not into violence, but into an act of "violently emotional political stupidity." Might preservation of peace and freedom keep them from it? They probably won't risk breaking the peace. But they might sacrifice freedom—a quality "so blithely sacrificed once before in exchange for Hitler's promise of civil order and national grandeur." We will find the answer only when the going gets tough.

Zink, it seems to me, is more concerned with past than future; more valuable to those who would learn lessons from the great and complicated experience of American occupation than to those who are concerned about the future of politics in Germany and in the world. Those students or artificers of plans and training for military government will have to go well beyond Zink, however; for the technician he offers chiefly a point of view and an introduction to the relevant monographs and studies, official and unofficial. It is unfortunate that he did not fully use his qualities as a political scientist and student of public administration to illuminate the field of forces within which the military planner and the educator must work. The impact of Morgenthau politics is referred to at many points, but not systematically explored. And the problems of civil-military relations are not deeply probed. Such operational questions as the proper role of tactical forces and of specially trained military government detachments are barely sketched. (Mindful of the morale crises of military government specialists, on the scene a year early in England, Zink would have us adopt something of the civilian-in-uniform compromise he thinks was achieved by OSS and by OWI.) Zink makes sense on the difficulties of shifting from military to State Department control in the immediate postwar period—it could not easily have been done.

Neither we nor the Germans will ever be the same again.

Lo at the Little Big Horn

CUSTER'S FALL: The Indian Side of the Story
By David Humphreys Miller
Duell, Sloan & Pearce, 1957
271 Pages; Illustrated; Maps; $4.50

Reviewed by
COL. R. ERNEST DUPUY, *USA, retired, distinguished Army historian and author of several military books, who has contributed many articles and reviews.*

As its subtitle implies, this is a partisan book. It is the Indians' side of the Battle of the Little Big Horn, 25 June 1876, where flamboyant Lieutenant Colonel George Armstrong Custer led five troops of the 7th Cavalry to death as a result of a rash grandstand play.

The author, who has been working on his book since 1935, has painstakingly gathered the personal testimony of more than seventy Indians who participated in the fight either as enemies or as Indian Scouts of the Army. From these accounts he has woven a remarkably coherent running story; an excellent job of reporting.

Mr. Miller, one of the present-day leading authorities on the American Indian, speaks many of the Plains Indian dialects. He has lived among them and he is familiar with the Little Big Horn terrain. His work constitutes the best available testimony from the enemy side.

Against this, one must remember that his witnesses were men and women all of advanced age (they are all dead now), and their stories must perforce bear the patina with which old age glosses long-told tales.

One senses also that Mr. Miller is so entranced by the Indian and his ways that sometimes he overlooks his faults, and enlarges on the shortcomings of the Army and its people. This latter point is unfortunate, since it has led him to give an erroneous impression of both Generals Sheridan and Crook.

Having noted these things, this reviewer proclaims for the record that this is a well-written, fascinating, fast-moving book. It is the perfect antidote to the once-prevalent hero-worship of a vainglorious soldier whose personal bravery is beyond question, but whose military judgment may be rated at zero.

Everyone interested in our Indian-fighting Army should add this book to their collection, even though the lack of an index may at times infuriate the user. Aside from the main subject—the battle—the copious interlarding of Indian customs and behavior makes for both interesting and informative reading.

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